FCC Test Report

FCC ID	:	**MXF-WVRTM127ACN**
Equipment	:	**Indoor Wi-Fi Router**
Model No.	:	**WVRTM-127ACN**
Brand Name	:	**Gemtek**
Applicant	:	**Gemtek Technology Co., Ltd.**
Address	:	**No. 15-1 Zhonghua Road, Hsinchu Industrial Park, Hukou, Hsinchu, Taiwan, 30352.**
Standard	:	**47 CFR FCC Part 15.247**
Received Date	:	**Fed. 23, 2017**
Tested Date	:	**Mar. 01 ~ Oct. 24, 2017**

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by: **Approved by:**

Along Chen / Assistant Manager **Gary Chang / Manager**

Testing Laboratory 2732

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Release Record

Report No.	Version	Description	Issued Date
FR7O1102AC	Rev. 01	Initial issue	Nov. 13, 2017

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	Conducted Emissions	[dBuV]: 0.474MHz 38.28 (Margin -8.17dB) - AV	Pass
15.247(d) 15.209	Radiated Emissions	[dBuV/m at 3m]: 4874.00MHz 52.96 (Margin -1.04dB) - AV 2488.000MHz 52.96 (Margin -1.04dB) - AV	Pass
15.247(b)(3)	Maximum Output Power	Max Power [dBm]: 26.27	Pass
15.247(a)(2)	6dB Bandwidth	Meet the requirement of limit	Pass
15.247(e)	Power Spectral Density	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	Pass

1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

RF General Information					
Frequency Range (MHz)	**IEEE Std. 802.11**	**Ch. Freq. (MHz)**	**Channel Number**	**Transmit Chains (N_{TX})**	**Data Rate / MCS**
2400-2483.5	b	2412-2462	1-11 [11]	2	1-11 Mbps
2400-2483.5	g	2412-2462	1-11 [11]	2	6-54 Mbps
2400-2483.5	n (HT20)	2412-2462	1-11 [11]	2	MCS 0-15
2400-2483.5	n (HT40)	2422-2452	3-9 [7]	2	MCS 0-15
Note 1: RF output power specifies that Maximum Peak Conducted Output Power. Note 2: 802.11b uses a combination of DSSS-DBPSK, DQPSK, CCK modulation. Note 3: 802.11g/n uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.					

1.1.2 Antenna Details

Ant. No.	**Model**	**Type**	**Connector**	**Operating Frequency (MHz) / Gain (dBi)**		
				2400~2483.5	**5150~5250**	**5725~5850**
1	BLACK	PIFA	IPEX	2.34	2.48	5.06
2	GRAY	PIFA	IPEX	2.4	2	4.14

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	56Vdc from adapter

1.1.4 Accessories

Accessories		
No.	**Equipment**	**Description**
1	Adapter	Brand: PHIHONG Model: PSAA30R-560 Power Rating: I/P: 100-240Vac, 50-60Hz, 0.8A O/P: 56Vdc, 0.536A Power Line: 1.5m non-shielded without core
2	Adapter	Brand: Gospell Model: G0753-560-054 Power Rating: I/P: 100-240Vac, 50-60Hz, 0.75A O/P: 56Vdc, 0.54A Power Line: 1.2m non-shielded without core
3	RJ45 (EEKSONG)	1.4m non-shielded without core
4	RJ45 (Tong-Li)	1.4m non-shielded without core

1.1.5 Channel List

Frequency band (MHz)		**2400~2483.5**	
802.11 b / g / n HT20		**802.11n HT40**	
Channel	**Frequency(MHz)**	**Channel**	**Frequency(MHz)**
1	2412	3	2422
2	2417	4	2427
3	2422	5	2432
4	2427	6	2437
5	2432	7	2442
6	2437	8	2447
7	2442	9	2452
8	2447	---	---
9	2452	---	---
10	2457	---	---
11	2462	---	---

1.1.6 Test Tool and Duty Cycle

Test Tool	MT7603, version: 0.0.068		
Duty Cycle and Duty Factor	Mode	Duty cycle (%)	Duty factor (dB)
	11b	100.00%	0.00
	11g	98.49%	0.07
	HT20	92.04%	0.36
	HT40	89.74%	0.47

1.1.7 Power Setting

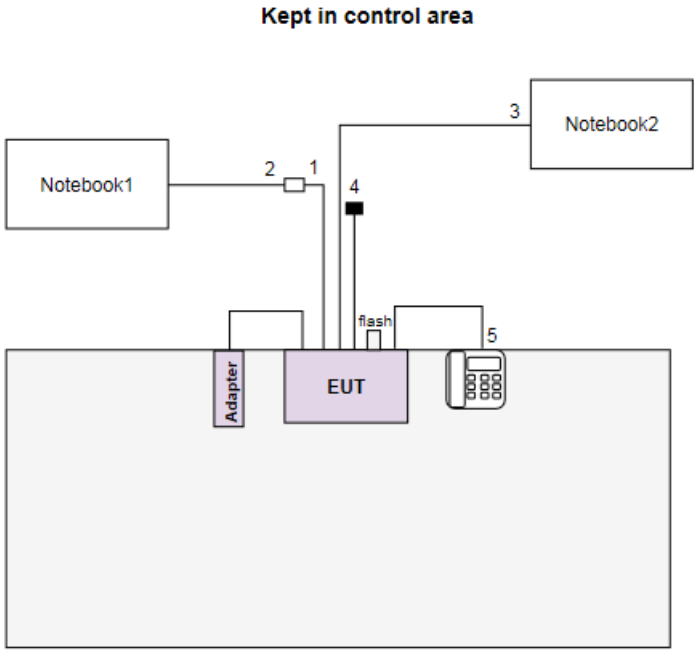
Modulation Mode	Test Frequency (MHz)	Power Set
11b	2412	24
11b	2437	24
11b	2462	24
11g	2412	1F
11g	2437	28
11g	2462	1F
HT20	2412	1E
HT20	2437	28
HT20	2462	1E
HT40	2422	18
HT40	2437	21
HT40	2452	18

1.2 Local Support Equipment List

Support Equipment List					
No.	**Equipment**	**Brand**	**Model**	**FCC ID**	**Signal cable / Length (m)**
1	Notebook	DELL	Latitude E6430	DoC	RJ45, 10m non-shielded.
	Notebook	DELL	Latitude E6430	DoC	RJ45, 10m non-shielded.
2	Phone	HTT	HTT-806	---	RJ11, 1.5m non-shielded.
3	USB Flash	Kingston	DTSE9	---	---

1.3 Test Setup Chart

Test Setup Diagram



1. RJ45, 1.4m non-shielded
2-3. RJ45, 10m non-shielded
4. RJ45, 1m non-shielded with load
5. RJ11, 1.5m non-shielded

1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	Oct. 24, 2017				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Receiver	R&S	ESR3	101657	Dec. 21, 2016	Dec. 20, 2017
LISN	SCHWARZBECK	Schwarzbeck 8127	8127-667	Nov. 08, 2016	Nov. 07, 2017
RF Cable-CON	EMC	EMCCFD300-BM-BM-6000	50821	Dec. 20, 2016	Dec. 19, 2017
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission below 1GHz				
Test Site	966 chamber 3 / (03CH03-WS)				
Tested Date	Oct. 23, 2017				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Receiver	Agilent	N9038A	MY53290044	Sep. 26, 2017	Sep. 25, 2018
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-685	Apr. 28, 2017	Apr. 27, 2018
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 10, 2016	Nov. 09, 2017
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Dec. 09, 2016	Dec. 08, 2017
Preamplifier	EMC	EMC02325	980187	Sep. 04, 2017	Sep. 03, 2018
LF cable-0.8M	EMC	EMC8D-NM-NM-800	EMC8D-NM-NM-800-001	Feb. 04, 2017	Feb. 03, 2018
LF cable-3M	EMC	EMC8D-NM-NM-3000	131103	Feb. 04, 2017	Feb. 03, 2018
LF cable-13M	EMC	EMC8D-NM-NM-13000	131104	Feb. 04, 2017	Feb. 03, 2018
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission above 1GHz				
Test Site	966 chamber 3 / (03CH03-WS)				
Tested Date	Mar. 01, 2017				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	Agilent	N9010A	MY53400091	Sep. 09, 2016	Sep. 08, 2017
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1206	Feb. 09, 2017	Feb. 08, 2018
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Oct. 25, 2016	Oct. 24, 2017
Preamplifier	Agilent	83017A	MY53270014	Aug. 22, 2016	Aug. 21, 2017
Preamplifier	EMC	EMC184045B	980192	Aug. 24, 2016	Aug. 23, 2017
RF cable-3M	HUBER+SUHNER	SUCOFLEX104	MY22620/4	Feb. 04, 2017	Feb. 03, 2018
RF cable-8M	HUBER+SUHNER	SUCOFLEX104	MY22600/4	Feb. 04, 2017	Feb. 03, 2018
RF cable-1M	HUBER+SUHNER	SUCOFLEX104	MY22624/4	Feb. 04, 2017	Feb. 03, 2018
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Tested Date	Mar. 08, 2017				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	ROHDE&SCHWARZ	FSV40	101486	Nov. 15, 2016	Nov. 14, 2017
Power Meter	Anritsu	ML2495A	1241002	Oct. 06, 2016	Oct. 05, 2017
Power Sensor	Anritsu	MA2411B	1207366	Oct. 06, 2016	Oct. 05, 2017
AC POWER SOURCE	APC	AFC-500W	F312060012	Oct. 28, 2016	Oct. 27, 2017
Measurement Software	Sporton	Sporton_1	1.3.30	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards and KDB documents.

47 CFR FCC Part 15.247
ANSI C63.10-2013
FCC KDB 558074 D01 DTS Meas Guidance v04
FCC KDB 662911 D01 Multiple Transmitter Output v02r01

1.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Measurement Uncertainty	
Parameters	**Uncertainty**
Bandwidth	±34.134 Hz
Conducted power	±0.808 dB
Power density	±0.463 dB
Conducted emission	±2.670 dB
AC conducted emission	±2.90 dB
Radiated emission ≤ 1GHz	±3.66 dB
Radiated emission > 1GHz	±5.37 dB

2 Test Configuration

2.1 Testing Condition

Test Item	Test Site	Ambient Condition	Tested By
AC Conduction	CO01-WS	22°C / 56%	Alex Tsai
Radiated Emissions	03CH03-WS	22-25°C / 64-65%	Brad Wu Vincent Yeh
RF Conducted	TH01-WS	20°C / 65%	Brad Wu

- FCC Designation No.: TW0009
- FCC site registration No.: 207696
- IC site registration No.: 10807C-1

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate (Mbps) / MCS	Test Configuration
Conducted Emissions	11g	2437	6 Mbps	---
Radiated Emissions ≤1GHz	11g	2437	6 Mbps	---
Radiated Emissions >1GHz Maximum Output Power 6dB bandwidth Power spectral density	11b 11g HT20 HT40	2412 / 2437 / 2462 2412 / 2437 / 2462 2412 / 2437 / 2462 2422 / 2437 / 2452	1 Mbps 6 Mbps MCS 0 MCS 0	---

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Y-plane** results were found as the worst case and were shown in this report.
2. Two RJ45 cables (EEKSONG & Tong-Li) had been covered during the pretest and found that **EEKSONG RJ45 cable** was the worst case and was selected for final testing.
3. Two adapters (PHIHONG & Gospell) had been covered during the pretest and found that **PHIHONG adapter was the worst case for radiated emission test**, and **Gospell adapter was the worst case for conducted emission test**.

3 Transmitter Test Results

3.1 Conducted Emissions

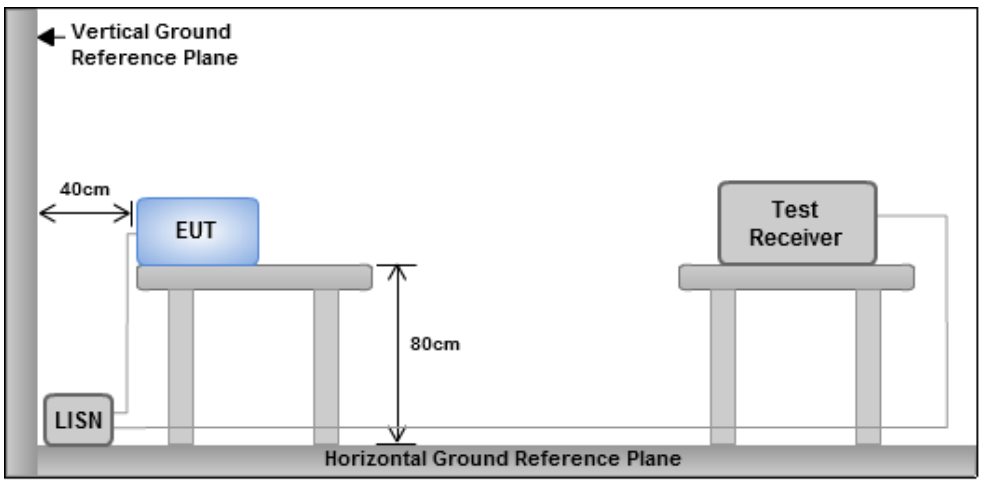
3.1.1 Limit of Conducted Emissions

Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

3.1.2 Test Procedures

1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
4. This measurement was performed with AC 120V / 60Hz.

3.1.3 Test Setup

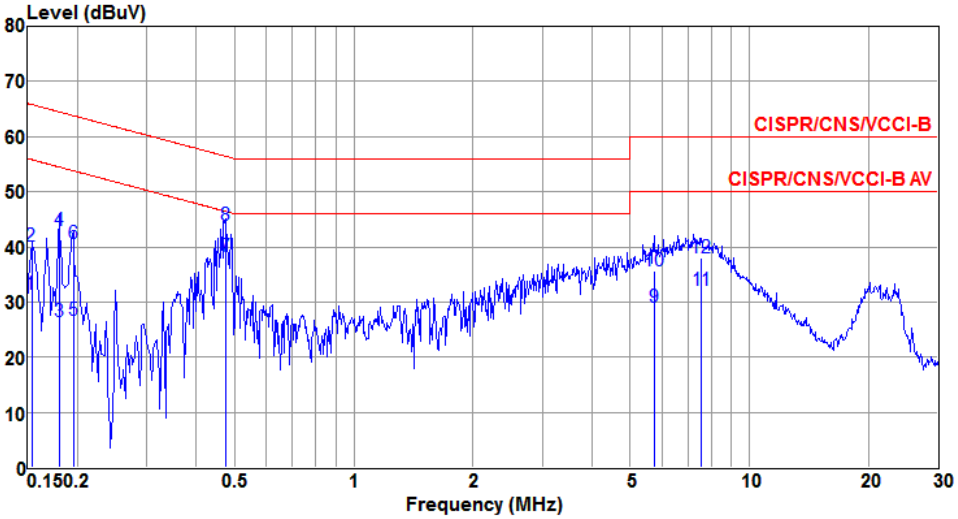


Note: 1. Support units were connected to second LISN.

2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 Test Result of Conducted Emissions

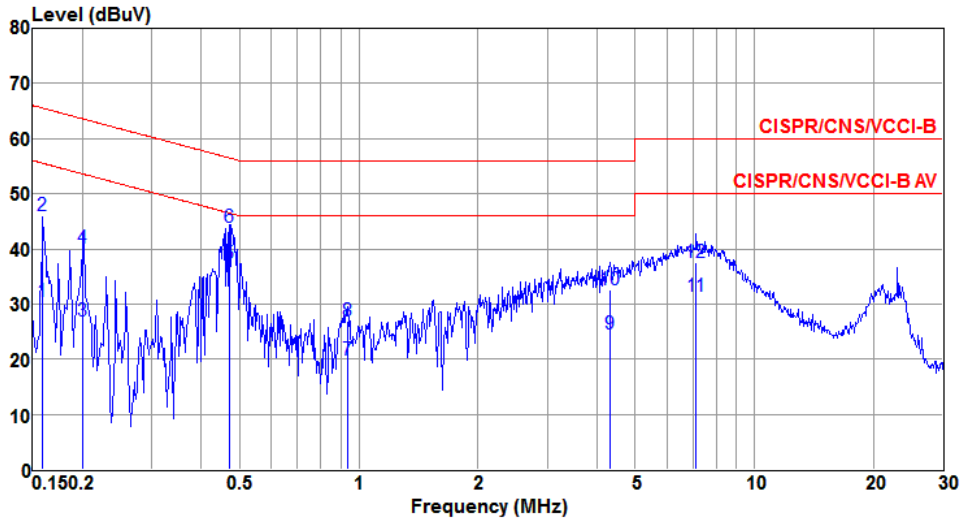
Modulation	11g	Test Freq. (MHz)	2437
Power Phase	Line		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.153	31.42	55.82	-24.40	31.00	0.38	0.04	Average
2	0.153	40.12	65.82	-25.70	39.70	0.38	0.04	QP
3	0.180	26.42	54.50	-28.08	25.99	0.39	0.04	Average
4	0.180	42.93	64.50	-21.57	42.50	0.39	0.04	QP
5	0.195	26.75	53.80	-27.05	26.32	0.39	0.04	Average
6	0.195	40.53	63.80	-23.27	40.10	0.39	0.04	QP
7@	0.474	38.28	46.45	-8.17	37.90	0.34	0.04	Average
8	0.474	44.01	56.45	-12.44	43.63	0.34	0.04	QP
9	5.744	28.97	50.00	-21.03	28.01	0.78	0.18	Average
10	5.744	35.67	60.00	-24.33	34.71	0.78	0.18	QP
11	7.566	32.06	50.00	-17.94	30.94	0.92	0.20	Average
12	7.566	37.94	60.00	-22.06	36.82	0.92	0.20	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

Modulation	11g	Test Freq. (MHz)	2437
Power Phase	Neutral		



	Freq	Level	Limit Line	Over Limit	Read Level	LISN factor	cable loss	Remark
	MHz	dBuV	dBuV	dB	dBuV	dB	dB	
1	0.159	30.39	55.52	-25.13	30.01	0.34	0.04	Average
2	0.159	46.03	65.52	-19.49	45.65	0.34	0.04	QP
3	0.201	26.90	53.58	-26.68	26.52	0.34	0.04	Average
4	0.201	40.11	63.58	-23.47	39.73	0.34	0.04	QP
5@	0.471	37.25	46.49	-9.24	36.83	0.38	0.04	Average
6	0.471	44.00	56.49	-12.49	43.58	0.38	0.04	QP
7	0.938	19.86	46.00	-26.14	19.46	0.36	0.04	Average
8	0.938	26.95	56.00	-29.05	26.55	0.36	0.04	QP
9	4.315	24.50	46.00	-21.50	23.77	0.57	0.16	Average
10	4.315	32.68	56.00	-23.32	31.95	0.57	0.16	QP
11	7.137	31.40	50.00	-18.60	30.57	0.63	0.20	Average
12	7.137	37.43	60.00	-22.57	36.60	0.63	0.20	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB).
2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

3.2 6dB and Occupied Bandwidth

3.2.1 Limit of 6dB Bandwidth

The minimum 6dB bandwidth shall be at least 500 kHz.

3.2.2 Test Procedures

6dB Bandwidth

1. Set resolution bandwidth (RBW) = 100 kHz, Video bandwidth = 300 kHz.
2. Detector = Peak, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

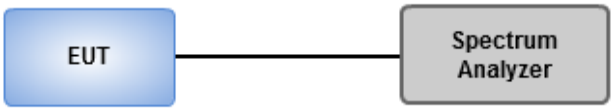
Occupied Bandwidth

1. Set resolution bandwidth (RBW) = 1 MHz, Video bandwidth = 3 MHz.
2. Detector = Sample, Trace mode = max hold.

3 Sweep = auto couple, Allow the trace to stabilize.

4. Use the OBW measurement function of spectrum analyzer to measure the occupied bandwidth.

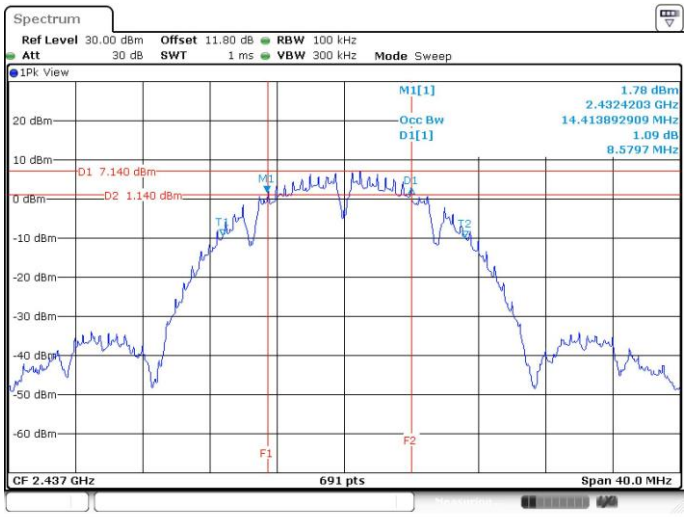
3.2.3 Test Setup



3.2.4 Test Result of 6dB and Occupied Bandwidth

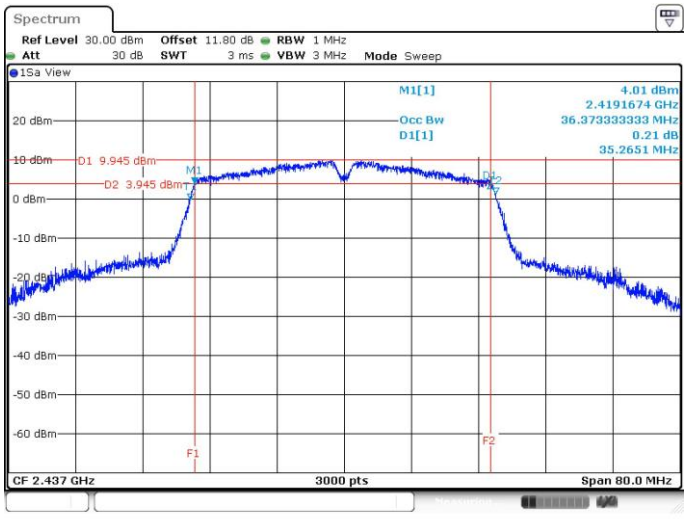
Modulation Mode	N_{TX}	Freq. (MHz)	6dB Bandwidth (MHz)				Limit (kHz)
			Chain 0	Chain 1	Chain 2	Chain 3	
11b	2	2412	9.57	9.10	---	---	500
11b	2	2437	10.03	8.58	---	---	500
11b	2	2462	9.04	9.57	---	---	500
11g	2	2412	13.86	15.36	---	---	500
11g	2	2437	15.13	15.07	---	---	500
11g	2	2462	13.86	15.13	---	---	500
HT20	2	2412	14.72	14.72	---	---	500
HT20	2	2437	15.13	15.13	---	---	500
HT20	2	2462	15.13	15.07	---	---	500
HT40	2	2422	35.13	35.01	---	---	500
HT40	2	2437	35.13	35.01	---	---	500
HT40	2	2452	35.13	35.01	---	---	500

Worst Plot



Modulation Mode	N_{TX}	Freq. (MHz)	99% Occupied Bandwidth (MHz)			
			Chain 0	Chain 1	Chain 2	Chain 3
11b	2	2412	14.87	14.63	---	---
11b	2	2437	14.84	14.48	---	---
11b	2	2462	14.75	14.43	---	---
11g	2	2412	16.89	16.63	---	---
11g	2	2437	20.64	17.33	---	---
11g	2	2462	16.95	16.53	---	---
HT20	2	2412	17.76	17.63	---	---
HT20	2	2437	21.77	18.35	---	---
HT20	2	2462	17.77	17.56	---	---
HT40	2	2422	35.97	36.19	---	---
HT40	2	2437	36.37	36.37	---	---
HT40	2	2452	36.00	36.19	---	---

Worst Plot



3.3 RF Output Power

3.3.1 Limit of RF Output Power

Conducted power shall not exceed 1Watt.

☒ Antenna gain <= 6dBi, no any corresponding reduction is in output power limit.

☐ Antenna gain > 6dBi

☐ Non Fixed, point to point operations.
The conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB

☐ Fixed, point to point operations
Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point Operations, maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 5725–5850 MHz band that are used exclusively for fixed, point-to-point operations ,no any corresponding reduction is in transmitter peak output power

3.3.2 Test Procedures

☒ Maximum Peak Conducted Output Power

☐ **Spectrum analyzer**

1. Set RBW = 1MHz, VBW = 3MHz, Detector = Peak.
2. Sweep time = auto, Trace mode = max hold, Allow trace to fully stabilize.
3. Use the spectrum analyzer channel power measurement function with the band limits set equal to the DTS bandwidth edges.

☒ **Power meter**

1. A broadband Peak RF power meter is used for output power measurement. The video bandwidth of power meter is greater than DTS bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.

☒ Maximum Conducted Output Power (For reference only)

☒ **Power meter**

1. A broadband Average RF power meter is used for output power measurement. The video bandwidth of power meter is greater than DTS bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.

3.3.3 Test Setup

3.3.4 Test Result of Maximum Output Power

Modulation Mode	N_{TX}	Freq. (MHz)	Peak conducted Output Power (dBm)							Ant. Gain (dBi)	EIRP (dBm)	EIRP Limit (dBm)
			Chain 0	Chain 1	Chain 2	Chain 3	Total Power (mW)	Total Power (dBm)	Limit (dBm)			
11b	2	2412	21.86	21.83	---	---	305.867	24.86	30.00	2.40	27.26	36.00
11b	2	2437	21.55	22.16	---	---	307.327	24.88	30.00	2.40	27.28	36.00
11b	2	2462	21.45	23.04	---	---	341.009	25.33	30.00	2.40	27.73	36.00
11g	2	2412	22.44	23.1	---	---	379.562	25.79	30.00	2.40	28.19	36.00
11g	2	2437	22.94	23.56	---	---	423.775	26.27	30.00	2.40	28.67	36.00
11g	2	2462	22.26	22.95	---	---	365.510	25.63	30.00	2.40	28.03	36.00
HT20	2	2412	21.96	22.75	---	---	345.401	25.38	30.00	2.40	27.78	36.00
HT20	2	2437	22.92	23.51	---	---	420.273	26.24	30.00	2.40	28.64	36.00
HT20	2	2462	21.85	22.69	---	---	338.889	25.30	30.00	2.40	27.70	36.00
HT40	2	2422	19.36	21.11	---	---	215.420	23.33	30.00	2.40	25.73	36.00
HT40	2	2437	22.15	23.04	---	---	365.431	25.63	30.00	2.40	28.03	36.00
HT40	2	2452	19.04	20.65	---	---	196.313	22.93	30.00	2.40	25.33	36.00

Modulation Mode	N_{TX}	Freq. (MHz)	Conducted (Average) Output Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)
			Chain 0	Chain 1	Chain 2	Chain 3			
11b	2	2412	18.08	17.94	---	---	126.499	21.02	---
11b	2	2437	17.84	18.56	---	---	132.593	21.23	---
11b	2	2462	17.67	18.92	---	---	136.462	21.35	---
11g	2	2412	15.81	17.48	---	---	94.082	19.74	---
11g	2	2437	18.95	19.13	---	---	160.370	22.05	---
11g	2	2462	15.64	16.95	---	---	86.189	19.35	---
HT20	2	2412	15.29	16.82	---	---	81.890	19.13	---
HT20	2	2437	18.93	19.12	---	---	159.821	22.04	---
HT20	2	2462	15.24	16.55	---	---	78.605	18.95	---
HT40	2	2422	11.95	13.62	---	---	38.682	15.88	---
HT40	2	2437	16.17	17.64	---	---	99.476	19.98	---
HT40	2	2452	11.69	13.14	---	---	35.363	15.49	---

Note: Conducted average output power is for reference only.

3.4 Power Spectral Density

3.4.1 Limit of Power Spectral Density

Power spectral density shall not be greater than 8 dBm in any 3 kHz band.

3.4.2 Test Procedures

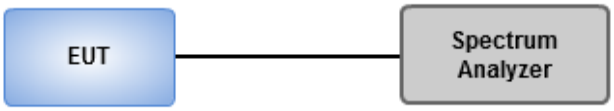
☒ Maximum peak conducted output power was used to demonstrate compliance to the fundamental output power limit.

1. Set the RBW = 3kHz, VBW = 10kHz.
2. Detector = Peak, Sweep time = auto couple.
3. Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

☐ Maximum (average) conducted output power was used to demonstrate compliance to the fundamental output power limit.

1. Set the RBW = 100kHz, VBW = 300 kHz.
2. Detector = RMS, Sweep time = auto couple.
3. Set the sweep time to: ≥ 10 x (number of measurement points in sweep) x (maximum data rate per stream).
4. Perform the measurement over a single sweep.
5. Use the peak marker function to determine the maximum amplitude level.

3.4.3 Test Setup

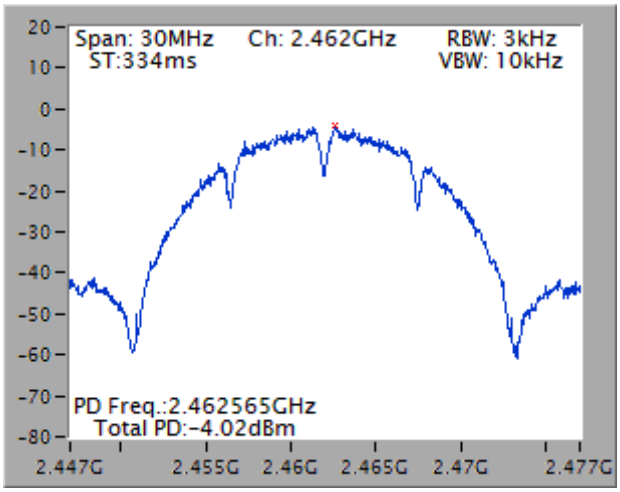


3.4.4 Test Result of Power Spectral Density

Modulation Mode	N_{TX}	Freq. (MHz)	Total Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)
11b	2	2412	-4.13	8.00
11b	2	2437	-4.59	8.00
11b	2	2462	-4.02	8.00
11g	2	2412	-8.27	8.00
11g	2	2437	-5.29	8.00
11g	2	2462	-8.66	8.00
HT20	2	2412	-7.32	8.00
HT20	2	2437	-5.20	8.00
HT20	2	2462	-8.03	8.00
HT40	2	2422	-13.77	8.00
HT40	2	2437	-9.99	8.00
HT40	2	2452	-14.17	8.00

Note: Test result is bin-by-bin summing measured value of each TX port.

Worst Plot



3.5 Unwanted Emissions into Restricted Frequency Bands

3.5.1 Limit of Unwanted Emissions into Restricted Frequency Bands

Restricted Band Emissions Limit			
Frequency Range (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m)**	**Measure Distance (m)**
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1:
Qusai-Peak value is measured for frequency below 1GHz except for 9–90 kHz, 110–490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit
Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

3.5.2 Test Procedures

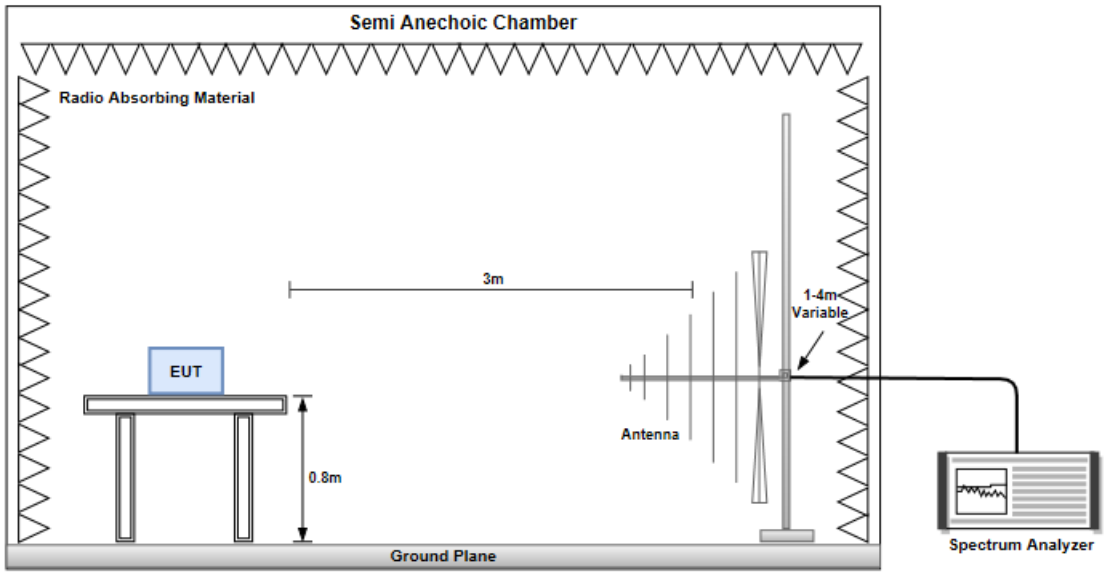
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

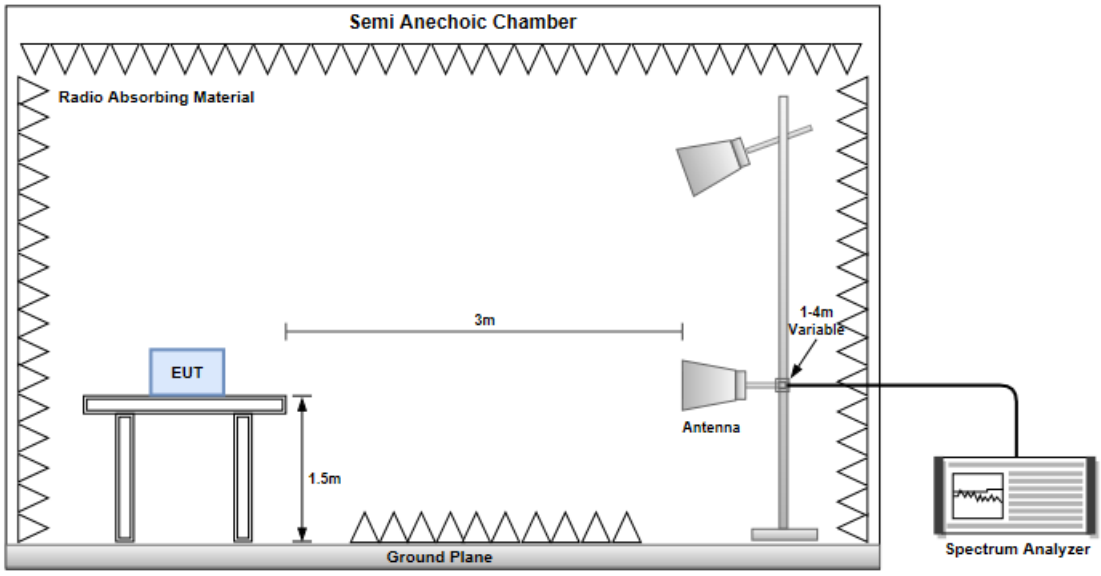
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

3.5.3 Test Setup

Radiated Emissions below 1 GHz

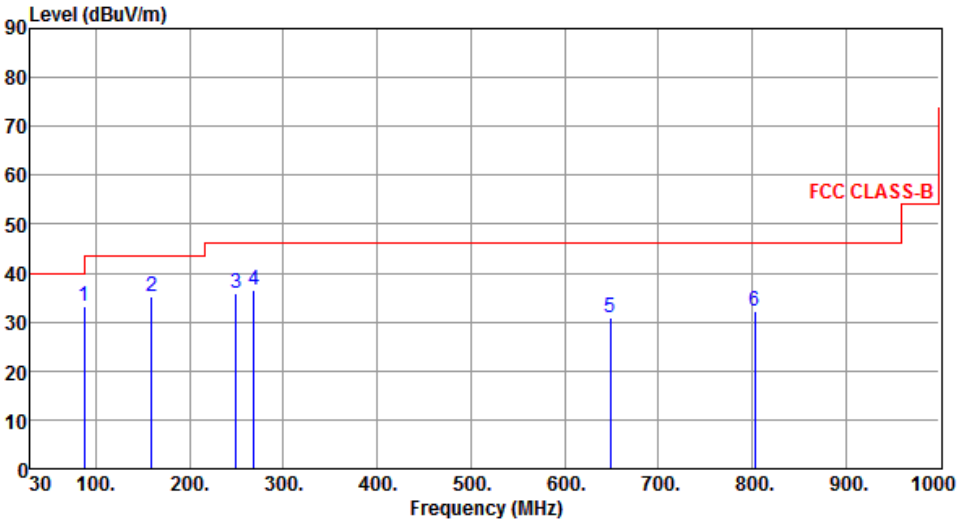


Radiated Emissions above 1 GHz



3.5.4 Transmitter Radiated Unwanted Emissions (Below 1GHz)

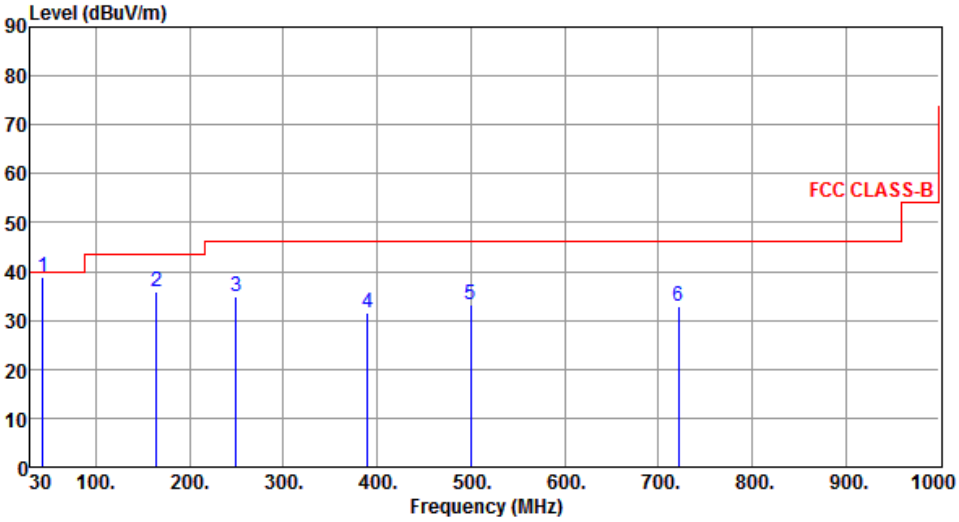
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	87.23	33.33	40.00	-6.67	47.45	-14.12	Peak	---	---
2	159.01	35.25	43.50	-8.25	43.54	-8.29	Peak	---	---
3	249.22	35.91	46.00	-10.09	45.30	-9.39	Peak	---	---
4	268.62	36.60	46.00	-9.40	45.39	-8.79	Peak	---	---
5	648.86	30.81	46.00	-15.19	31.24	-0.43	Peak	---	---
6	803.09	32.26	46.00	-13.74	30.05	2.21	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical		

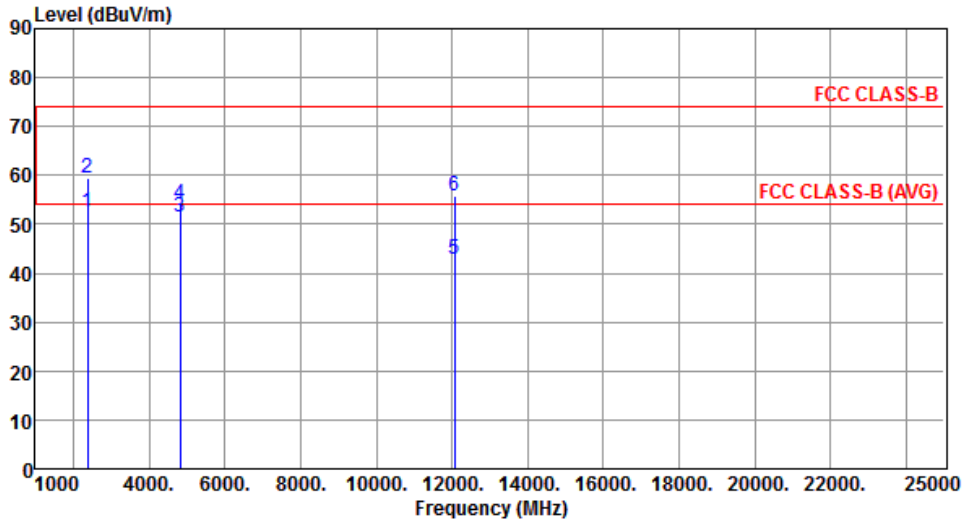


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	43.62	38.93	40.00	-1.07	47.41	-8.48	QP	100	113
2	164.83	35.78	43.50	-7.72	44.19	-8.41	Peak	---	---
3	249.22	34.78	46.00	-11.22	44.17	-9.39	Peak	---	---
4	389.87	31.68	46.00	-14.32	37.28	-5.60	Peak	---	---
5	499.48	33.21	46.00	-12.79	36.57	-3.36	Peak	---	---
6	721.61	32.75	46.00	-13.25	31.88	0.87	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

3.5.5 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11b

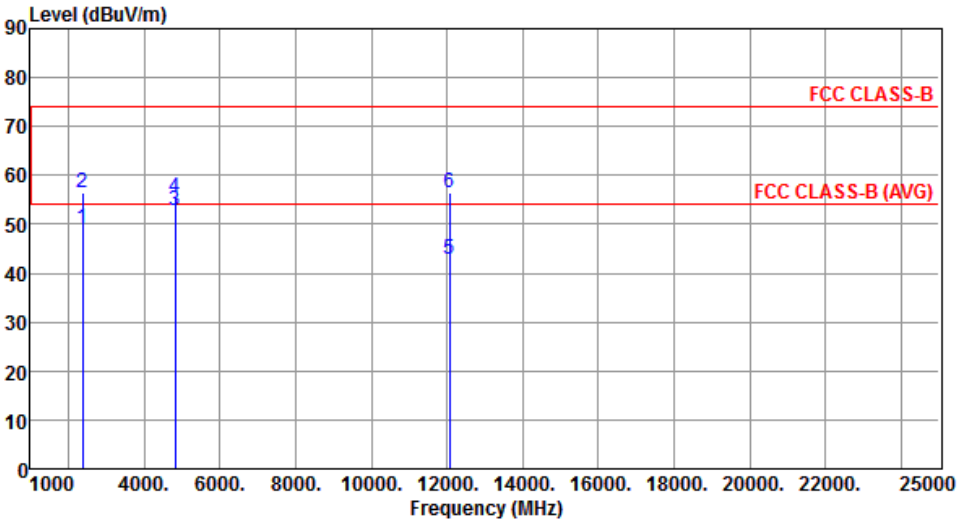
Modulation	11b	Test Freq. (MHz)	2412
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2388.00	52.32	54.00	-1.68	54.44	-2.12	Average	292	34
2	2388.00	59.30	74.00	-14.70	61.42	-2.12	Peak	292	34
3	4824.00	51.58	54.00	-2.42	47.10	4.48	Average	255	81
4	4824.00	54.02	74.00	-19.98	49.54	4.48	Peak	255	81
5	12060.00	42.82	54.00	-11.18	29.16	13.66	Average	284	22
6	12060.00	55.88	74.00	-18.12	42.22	13.66	Peak	284	22

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

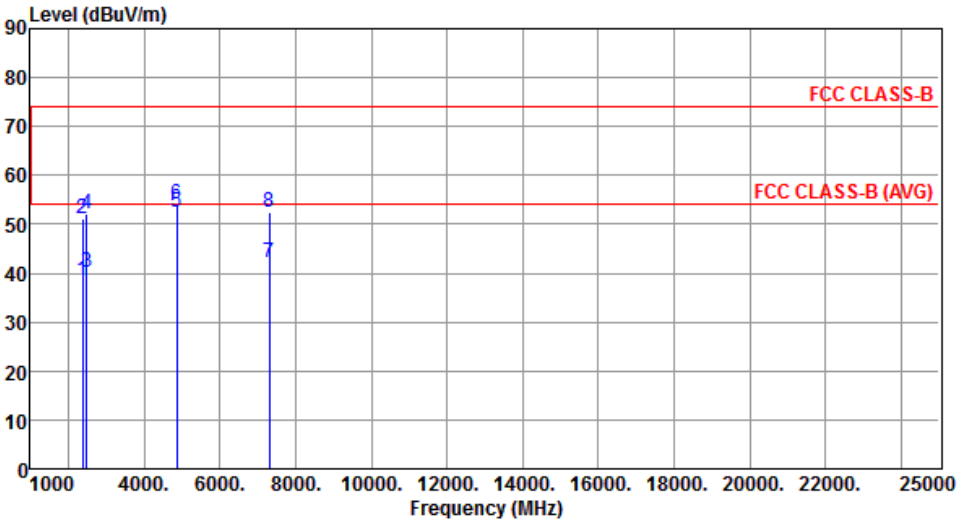
Modulation	11b	**Test Freq. (MHz)**	2412
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2388.00	49.01	54.00	-4.99	51.13	-2.12	Average	292	28
2	2388.00	56.35	74.00	-17.65	58.47	-2.12	Peak	292	28
3	4824.00	52.95	54.00	-1.05	48.47	4.48	Average	228	36
4	4824.00	55.46	74.00	-18.54	50.98	4.48	Peak	228	36
5	12060.00	42.71	54.00	-11.29	29.05	13.66	Average	256	35
6	12060.00	56.47	74.00	-17.53	42.81	13.66	Peak	256	35

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

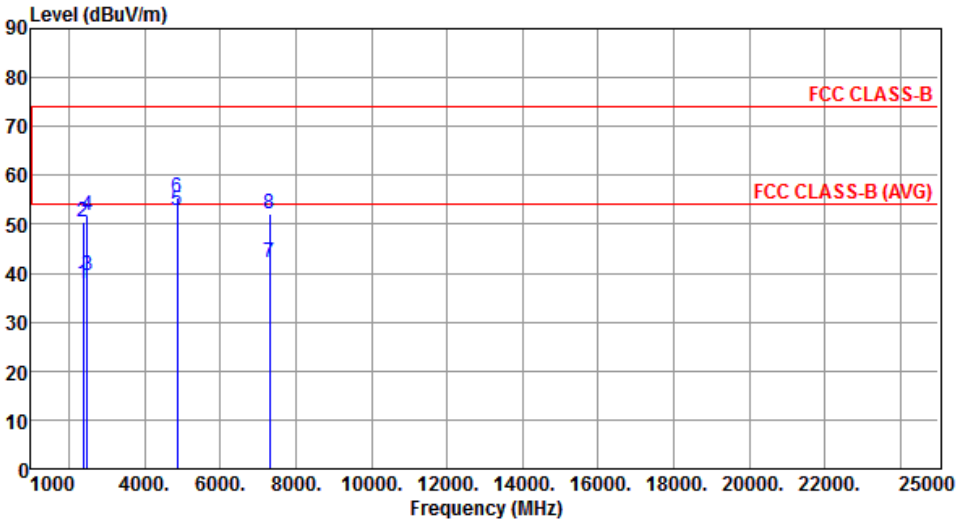
Modulation	11b	Test Freq. (MHz)	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	38.60	54.00	-15.40	40.72	-2.12	Average	264	268
2	2390.00	51.22	74.00	-22.78	53.34	-2.12	Peak	264	268
3	2483.50	40.32	54.00	-13.68	42.09	-1.77	Average	264	268
4	2483.50	52.04	74.00	-21.96	53.81	-1.77	Peak	264	268
5	4874.00	52.45	54.00	-1.55	47.87	4.58	Average	141	134
6	4874.00	54.11	74.00	-19.89	49.53	4.58	Peak	141	134
7	7311.00	42.25	54.00	-11.75	33.12	9.13	Average	238	163
8	7311.00	52.32	74.00	-21.68	43.19	9.13	Peak	238	163

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

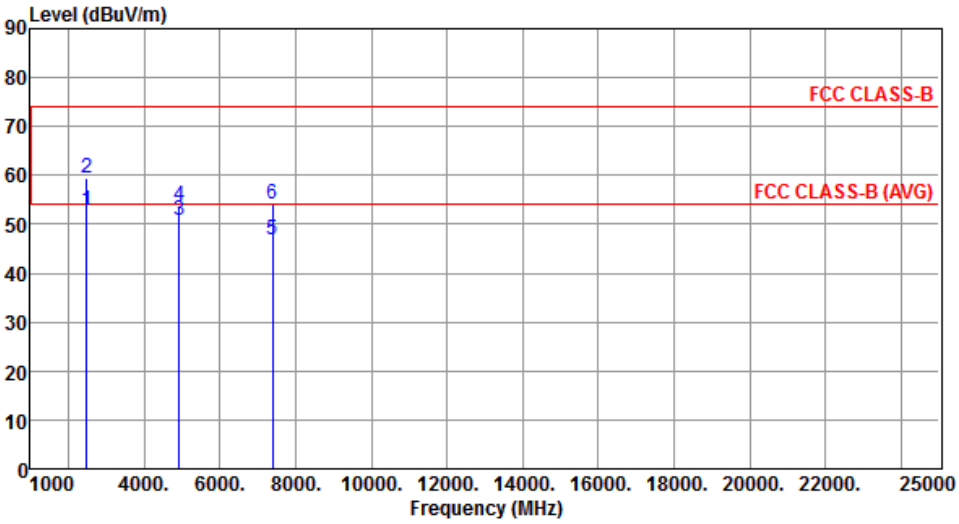
Modulation	11b	Test Freq. (MHz)	2437
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	37.80	54.00	-16.20	39.92	-2.12	Average	285	30
2	2390.00	50.45	74.00	-23.55	52.57	-2.12	Peak	285	30
3	2483.50	39.56	54.00	-14.44	41.33	-1.77	Average	285	30
4	2483.50	51.85	74.00	-22.15	53.62	-1.77	Peak	285	30
5	4874.00	52.96	54.00	-1.04	48.38	4.58	Average	227	36
6	4874.00	55.30	74.00	-18.70	50.72	4.58	Peak	227	36
7	7311.00	42.14	54.00	-11.86	33.01	9.13	Average	242	115
8	7311.00	52.04	74.00	-21.96	42.91	9.13	Peak	242	115

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

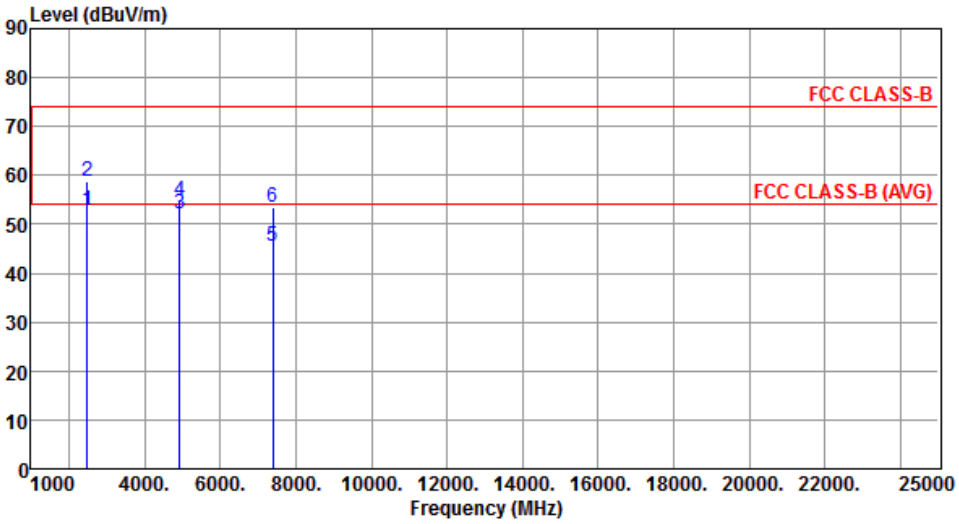
Modulation	11b	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2488.00	52.96	54.00	-1.04	54.70	-1.74	Average	257	267
2	2488.00	59.61	74.00	-14.39	61.35	-1.74	Peak	257	267
3	4924.00	50.93	54.00	-3.07	46.26	4.67	Average	251	255
4	4924.00	53.79	74.00	-20.21	49.12	4.67	Peak	251	255
5	7386.00	46.78	54.00	-7.22	37.38	9.40	Average	200	209
6	7386.00	54.15	74.00	-19.85	44.75	9.40	Peak	200	209

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	11b	Test Freq. (MHz)	2462
Polarization	Vertical		

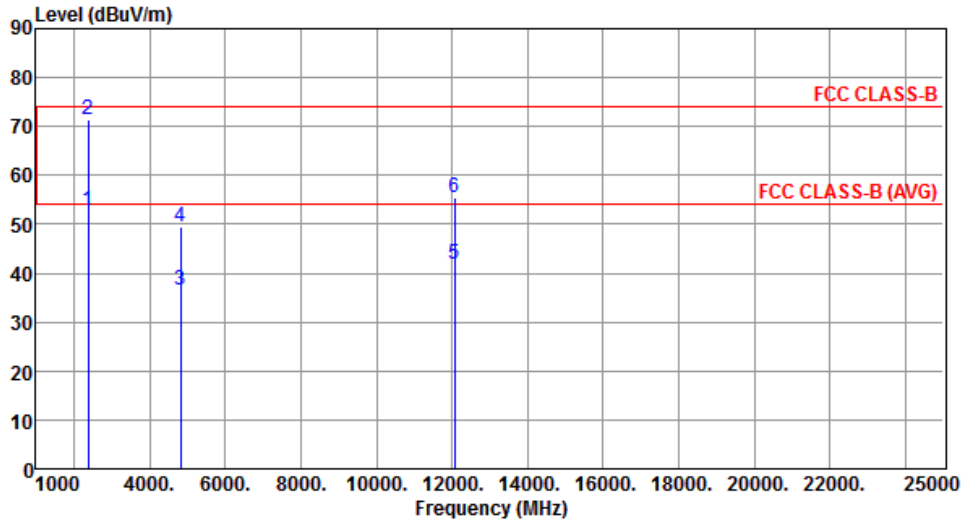


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2488.00	52.65	54.00	-1.35	54.39	-1.74	Average	279	31
2	2488.00	58.67	74.00	-15.33	60.41	-1.74	Peak	279	31
3	4924.00	52.25	54.00	-1.75	47.58	4.67	Average	223	38
4	4924.00	54.79	74.00	-19.21	50.12	4.67	Peak	223	38
5	7386.00	45.52	54.00	-8.48	36.12	9.40	Average	243	133
6	7386.00	53.59	74.00	-20.41	44.19	9.40	Peak	243	133

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

3.5.6 Transmitter Radiated Unwanted Emissions (Above 1GHz) for 11g

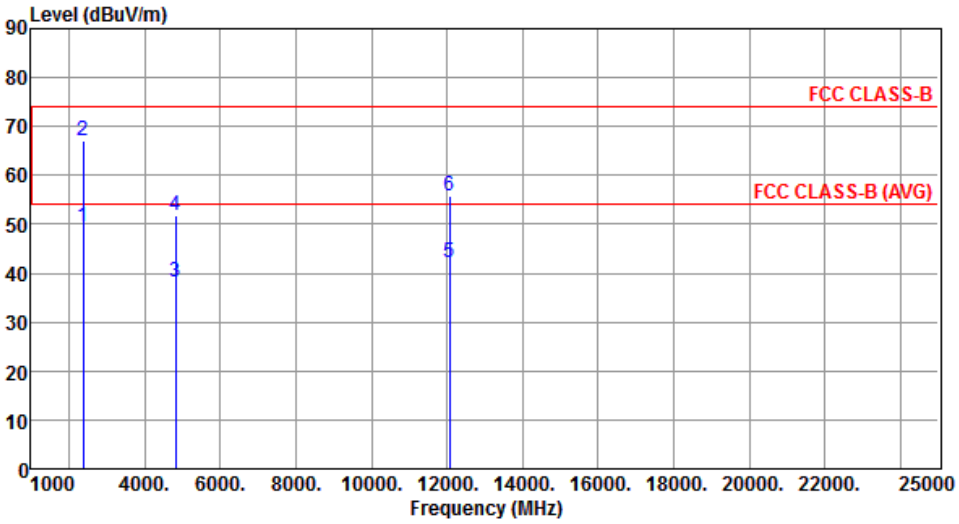
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	52.83	54.00	-1.17	54.95	-2.12	Average	252	72
2	2390.00	71.50	74.00	-2.50	73.62	-2.12	Peak	252	72
3	4824.00	36.52	54.00	-17.48	32.04	4.48	Average	241	251
4	4824.00	49.44	74.00	-24.56	44.96	4.48	Peak	241	251
5	12060.00	41.82	54.00	-12.18	28.16	13.66	Average	226	49
6	12060.00	55.53	74.00	-18.47	41.87	13.66	Peak	226	49

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

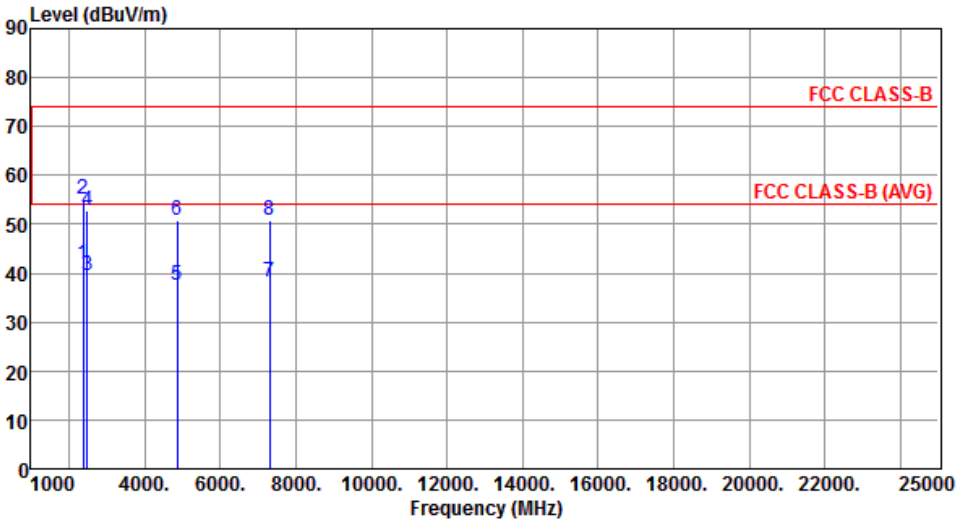
Modulation	11g	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	49.48	54.00	-4.52	51.60	-2.12	Average	286	109
2	2390.00	66.98	74.00	-7.02	69.10	-2.12	Peak	286	109
3	4824.00	38.19	54.00	-15.81	33.71	4.48	Average	205	3
4	4824.00	51.96	74.00	-22.04	47.48	4.48	Peak	205	3
5	12060.00	42.22	54.00	-11.78	28.56	13.66	Average	251	129
6	12060.00	55.63	74.00	-18.37	41.97	13.66	Peak	251	129

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

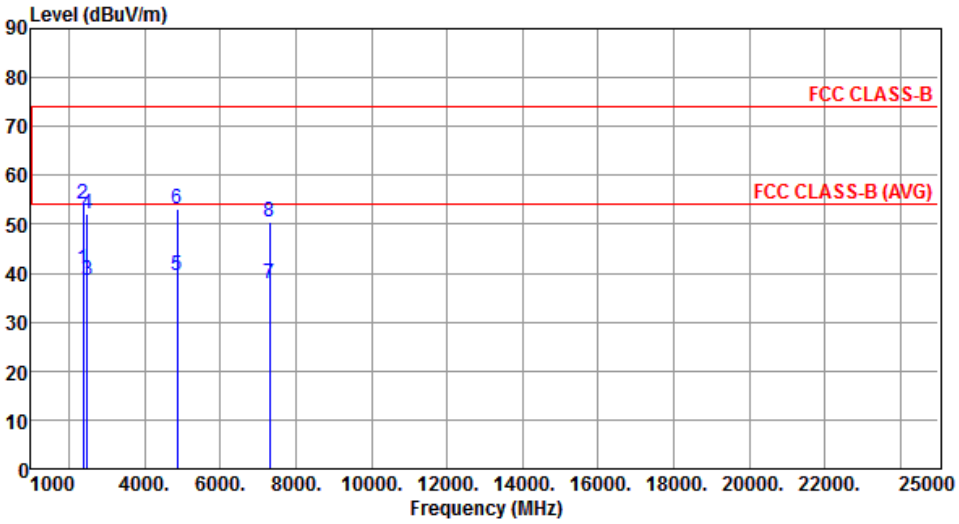
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	41.70	54.00	-12.30	43.82	-2.12	Average	278	71
2	2390.00	55.05	74.00	-18.95	57.17	-2.12	Peak	278	71
3	2483.50	39.36	54.00	-14.64	41.13	-1.77	Average	278	71
4	2483.50	52.69	74.00	-21.31	54.46	-1.77	Peak	278	71
5	4874.00	37.69	54.00	-16.31	33.11	4.58	Average	239	248
6	4874.00	50.73	74.00	-23.27	46.15	4.58	Peak	239	248
7	7311.00	38.31	54.00	-15.69	29.18	9.13	Average	241	45
8	7311.00	50.69	74.00	-23.31	41.56	9.13	Peak	241	45

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

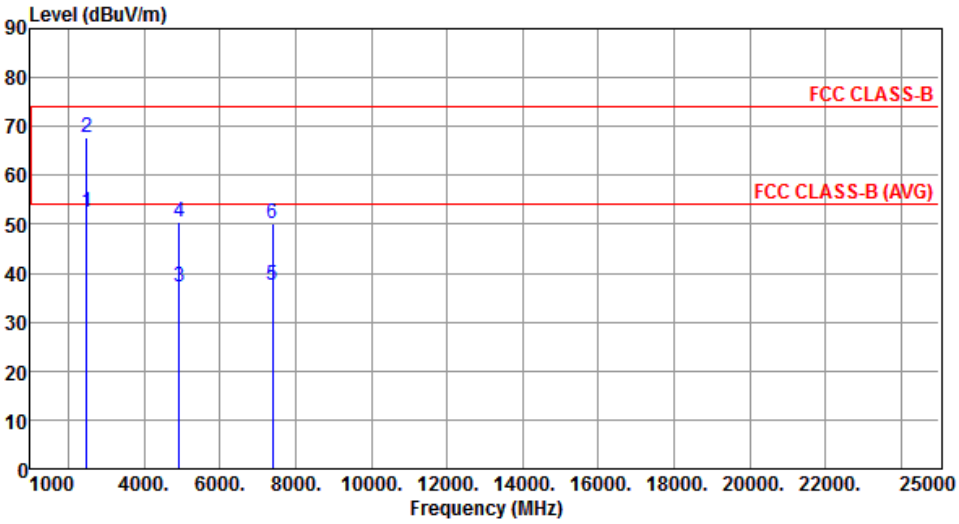
Modulation	11g	Test Freq. (MHz)	2437
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	40.91	54.00	-13.09	43.03	-2.12	Average	288	110
2	2390.00	54.12	74.00	-19.88	56.24	-2.12	Peak	288	110
3	2483.50	38.44	54.00	-15.56	40.21	-1.77	Average	288	110
4	2483.50	52.03	74.00	-21.97	53.80	-1.77	Peak	288	110
5	4874.00	39.41	54.00	-14.59	34.83	4.58	Average	216	1
6	4874.00	53.17	74.00	-20.83	48.59	4.58	Peak	216	1
7	7311.00	38.02	54.00	-15.98	28.89	9.13	Average	269	81
8	7311.00	50.45	74.00	-23.55	41.32	9.13	Peak	269	81

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

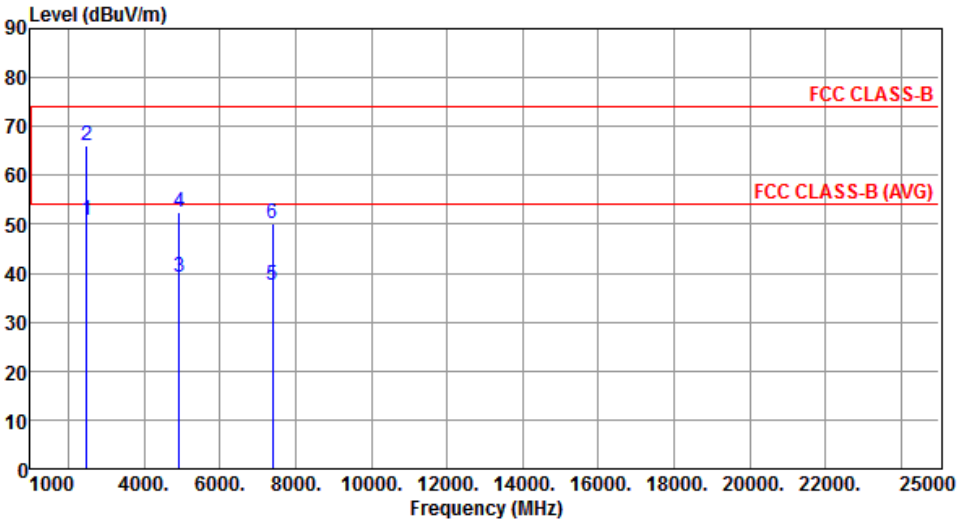
Modulation	11g	**Test Freq. (MHz)**	2462
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	52.40	54.00	-1.60	54.17	-1.77	Average	276	35
2	2483.50	67.62	74.00	-6.38	69.39	-1.77	Peak	276	35
3	4924.00	37.25	54.00	-16.75	32.58	4.67	Average	241	242
4	4924.00	50.41	74.00	-23.59	45.74	4.67	Peak	241	242
5	7386.00	37.54	54.00	-16.46	28.14	9.40	Average	245	46
6	7386.00	50.12	74.00	-23.88	40.72	9.40	Peak	245	46

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	11g	Test Freq. (MHz)	2462
Polarization	Vertical		

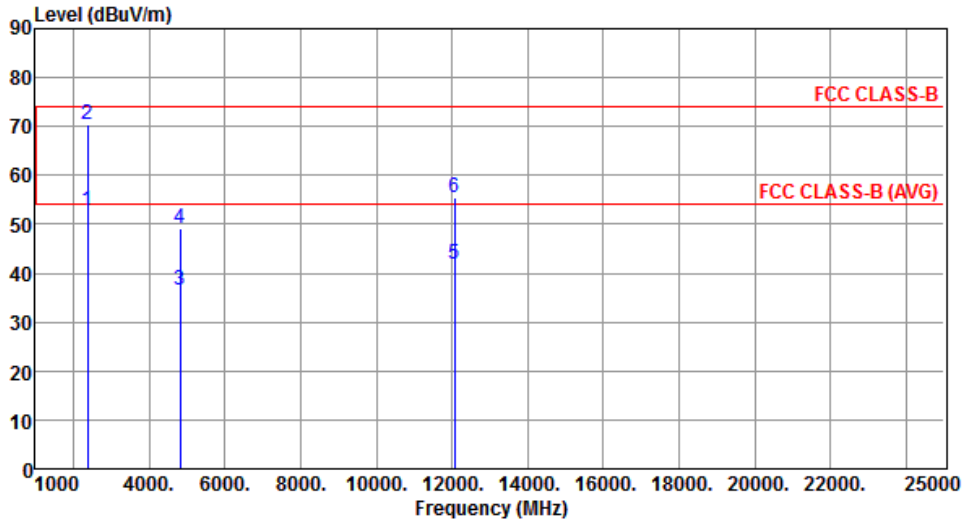


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	50.65	54.00	-3.35	52.42	-1.77	Average	288	108
2	2483.50	65.98	74.00	-8.02	67.75	-1.77	Peak	288	108
3	4924.00	39.15	54.00	-14.85	34.48	4.67	Average	216	6
4	4924.00	52.61	74.00	-21.39	47.94	4.67	Peak	216	6
5	7386.00	37.65	54.00	-16.35	28.25	9.40	Average	259	62
6	7386.00	50.11	74.00	-23.89	40.71	9.40	Peak	259	62

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

3.5.7 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT20

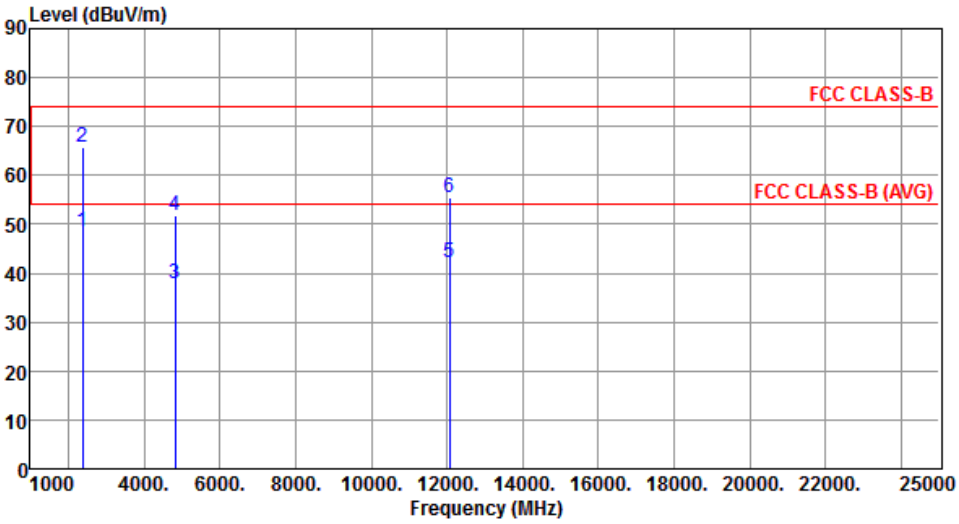
Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	52.77	54.00	-1.23	54.89	-2.12	Average	252	69
2	2390.00	70.28	74.00	-3.72	72.40	-2.12	Peak	252	69
3	4824.00	36.45	54.00	-17.55	31.97	4.48	Average	242	255
4	4824.00	49.31	74.00	-24.69	44.83	4.48	Peak	242	255
5	12060.00	41.69	54.00	-12.31	28.03	13.66	Average	221	53
6	12060.00	55.42	74.00	-18.58	41.76	13.66	Peak	221	53

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

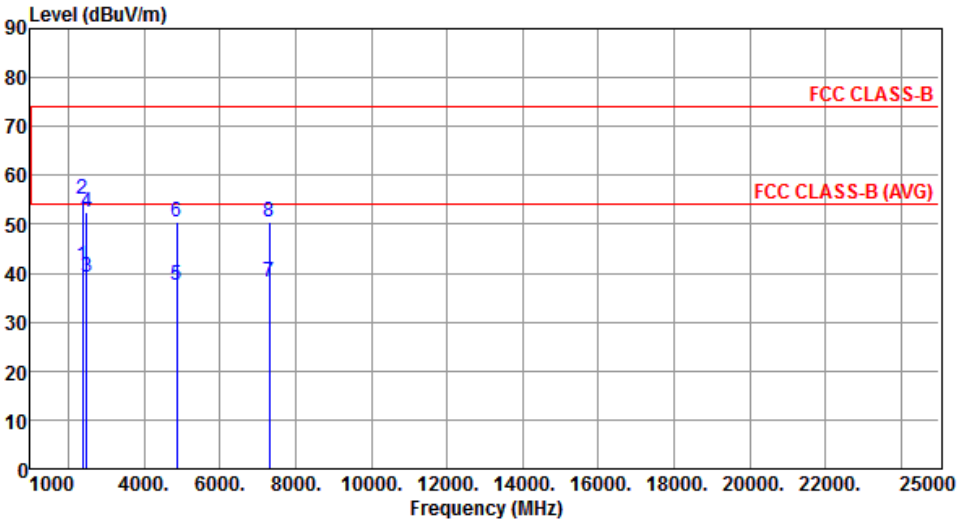
Modulation	HT20	Test Freq. (MHz)	2412
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	48.35	54.00	-5.65	50.47	-2.12	Average	281	112
2	2390.00	65.81	74.00	-8.19	67.93	-2.12	Peak	281	112
3	4824.00	38.02	54.00	-15.98	33.54	4.48	Average	210	11
4	4824.00	51.79	74.00	-22.21	47.31	4.48	Peak	210	11
5	12060.00	42.13	54.00	-11.87	28.47	13.66	Average	248	112
6	12060.00	55.49	74.00	-18.51	41.83	13.66	Peak	248	112

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

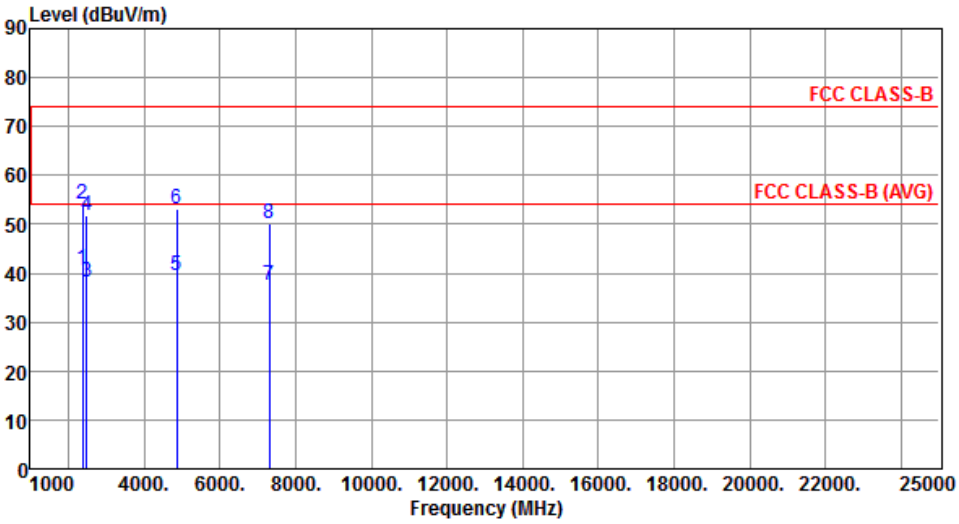
Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	41.52	54.00	-12.48	43.64	-2.12	Average	275	68
2	2390.00	54.98	74.00	-19.02	57.10	-2.12	Peak	275	68
3	2483.50	39.24	54.00	-14.76	41.01	-1.77	Average	275	68
4	2483.50	52.51	74.00	-21.49	54.28	-1.77	Peak	275	68
5	4874.00	37.52	54.00	-16.48	32.94	4.58	Average	242	253
6	4874.00	50.61	74.00	-23.39	46.03	4.58	Peak	242	253
7	7311.00	38.25	54.00	-15.75	29.12	9.13	Average	243	51
8	7311.00	50.61	74.00	-23.39	41.48	9.13	Peak	243	51

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

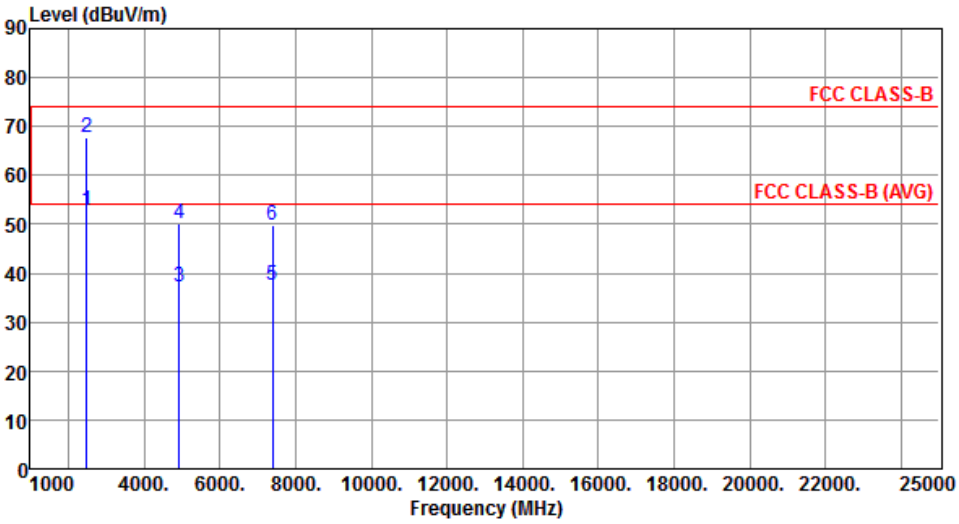
Modulation	HT20	Test Freq. (MHz)	2437
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	40.85	54.00	-13.15	42.97	-2.12	Average	289	108
2	2390.00	54.03	74.00	-19.97	56.15	-2.12	Peak	289	108
3	2483.50	38.29	54.00	-15.71	40.06	-1.77	Average	289	108
4	2483.50	51.96	74.00	-22.04	53.73	-1.77	Peak	289	108
5	4874.00	39.46	54.00	-14.54	34.88	4.58	Average	222	15
6	4874.00	53.22	74.00	-20.78	48.64	4.58	Peak	222	15
7	7311.00	37.69	54.00	-16.31	28.56	9.13	Average	265	54
8	7311.00	50.13	74.00	-23.87	41.00	9.13	Peak	265	54

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

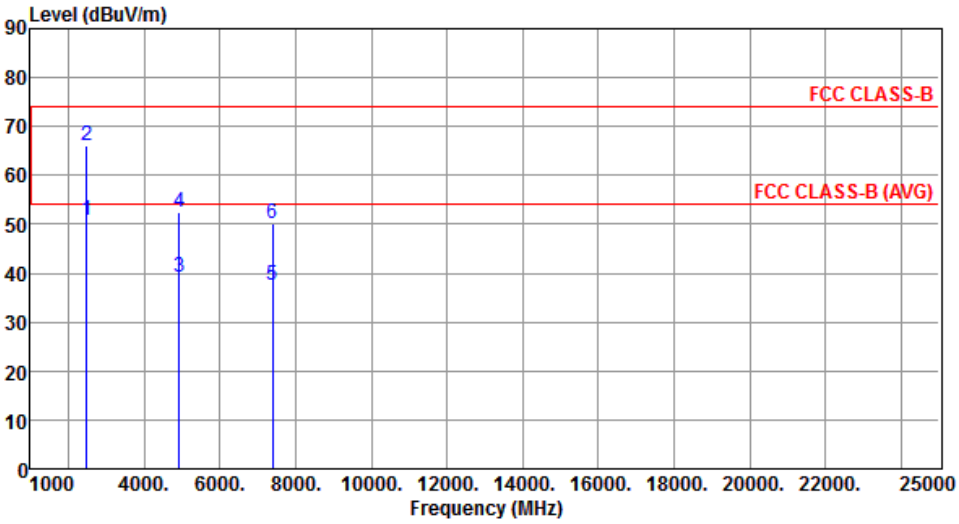
Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	52.92	54.00	-1.08	54.69	-1.77	Average	275	64
2	2483.50	67.81	74.00	-6.19	69.58	-1.77	Peak	275	64
3	4924.00	37.12	54.00	-16.88	32.45	4.67	Average	243	238
4	4924.00	50.26	74.00	-23.74	45.59	4.67	Peak	243	238
5	7386.00	37.41	54.00	-16.59	28.01	9.40	Average	242	53
6	7386.00	49.85	74.00	-24.15	40.45	9.40	Peak	242	53

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	HT20	Test Freq. (MHz)	2462
Polarization	Vertical		

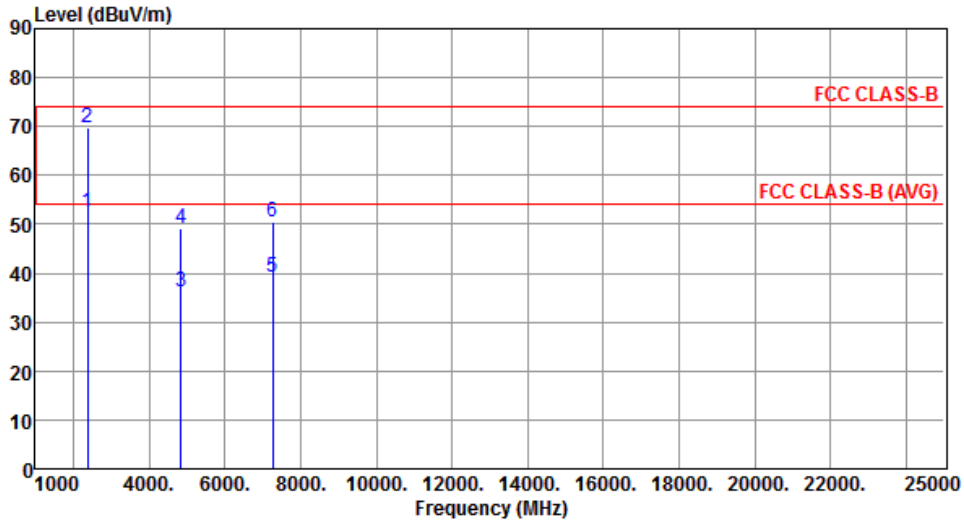


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	50.92	54.00	-3.08	52.69	-1.77	Average	285	106
2	2483.50	66.14	74.00	-7.86	67.91	-1.77	Peak	285	106
3	4924.00	39.06	54.00	-14.94	34.39	4.67	Average	215	12
4	4924.00	52.54	74.00	-21.46	47.87	4.67	Peak	215	12
5	7386.00	37.48	54.00	-16.52	28.08	9.40	Average	255	59
6	7386.00	50.06	74.00	-23.94	40.66	9.40	Peak	255	59

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

3.5.8 Transmitter Radiated Unwanted Emissions (Above 1GHz) for HT40

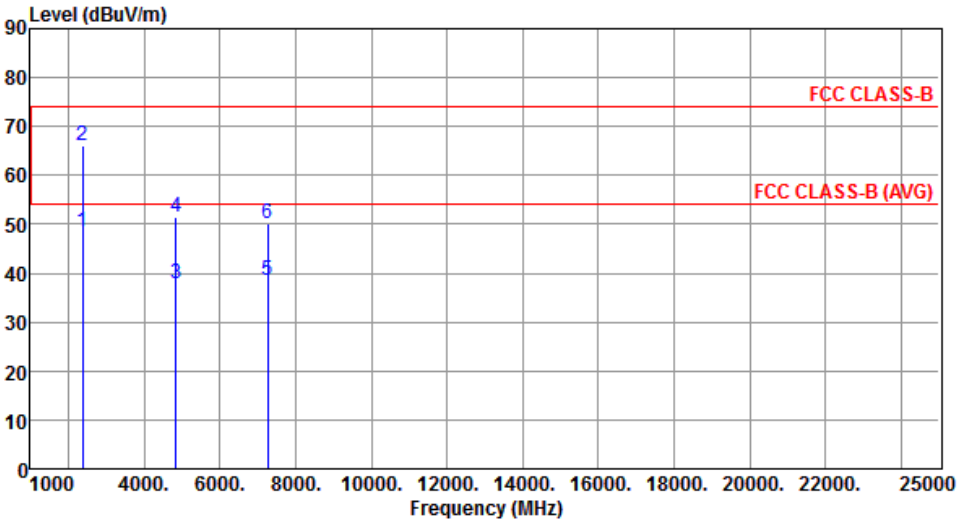
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	52.39	54.00	-1.61	54.51	-2.12	Average	252	69
2	2390.00	69.67	74.00	-4.33	71.79	-2.12	Peak	252	69
3	4844.00	36.25	54.00	-17.75	31.74	4.51	Average	239	248
4	4844.00	49.14	74.00	-24.86	44.63	4.51	Peak	239	248
5	7266.00	39.15	54.00	-14.85	30.18	8.97	Average	236	155
6	7266.00	50.38	74.00	-23.62	41.41	8.97	Peak	236	155

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

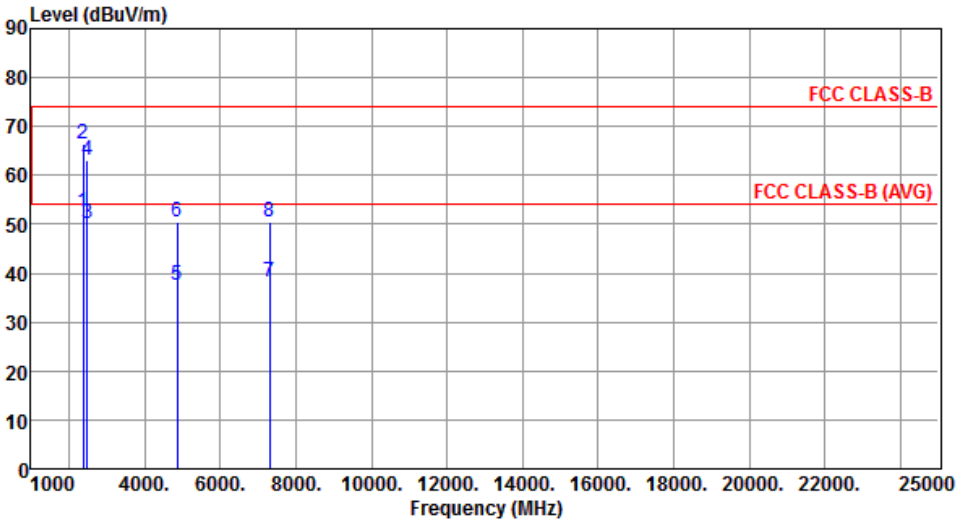
Modulation	HT40	Test Freq. (MHz)	2422
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	48.56	54.00	-5.44	50.68	-2.12	Average	278	106
2	2390.00	66.13	74.00	-7.87	68.25	-2.12	Peak	278	106
3	4844.00	37.96	54.00	-16.04	33.45	4.51	Average	205	14
4	4844.00	51.62	74.00	-22.38	47.11	4.51	Peak	205	14
5	7266.00	38.51	54.00	-15.49	29.54	8.97	Average	208	35
6	7266.00	50.06	74.00	-23.94	41.09	8.97	Peak	208	35

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

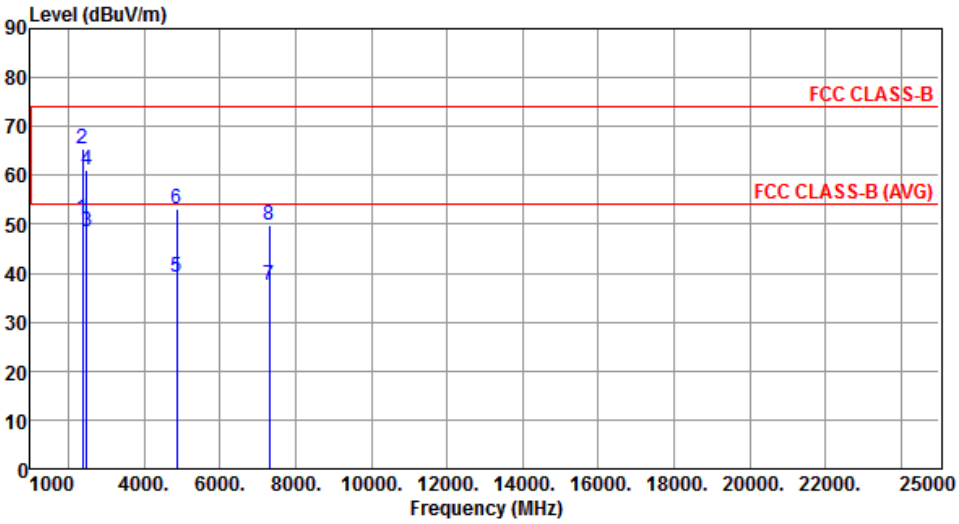
Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	52.45	54.00	-1.55	54.57	-2.12	Average	279	61
2	2390.00	66.49	74.00	-7.51	68.61	-2.12	Peak	279	61
3	2483.50	49.99	54.00	-4.01	51.76	-1.77	Average	274	60
4	2483.50	63.21	74.00	-10.79	64.98	-1.77	Peak	274	60
5	4874.00	37.42	54.00	-16.58	32.84	4.58	Average	245	251
6	4874.00	50.56	74.00	-23.44	45.98	4.58	Peak	245	251
7	7311.00	38.12	54.00	-15.88	28.99	9.13	Average	246	55
8	7311.00	50.43	74.00	-23.57	41.30	9.13	Peak	246	55

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

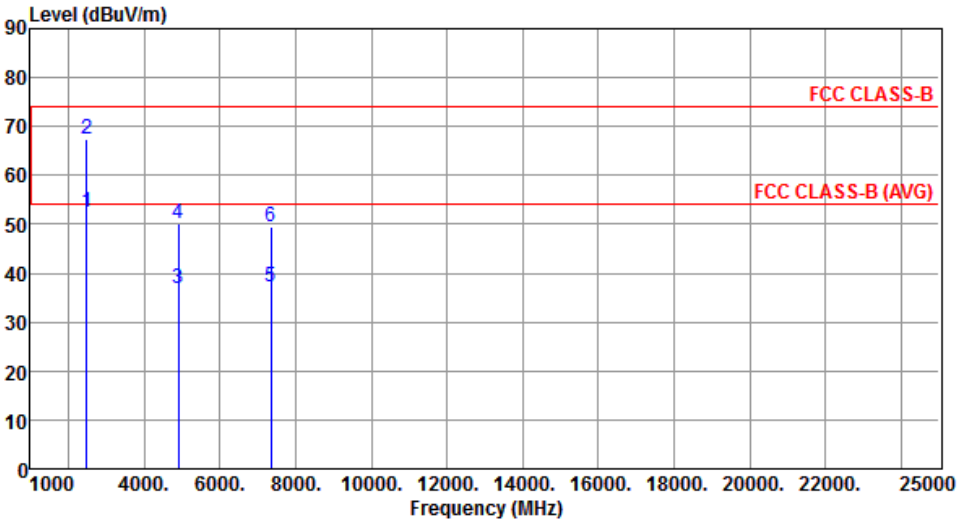
Modulation	HT40	Test Freq. (MHz)	2437
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2390.00	51.26	54.00	-2.74	53.38	-2.12	Average	286	110
2	2390.00	65.31	74.00	-8.69	67.43	-2.12	Peak	286	110
3	2483.50	48.52	54.00	-5.48	50.29	-1.77	Average	286	110
4	2483.50	61.05	74.00	-12.95	62.82	-1.77	Peak	286	110
5	4874.00	39.23	54.00	-14.77	34.65	4.58	Average	219	15
6	4874.00	53.04	74.00	-20.96	48.46	4.58	Peak	219	15
7	7311.00	37.42	54.00	-16.58	28.29	9.13	Average	253	61
8	7311.00	49.83	74.00	-24.17	40.70	9.13	Peak	253	61

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

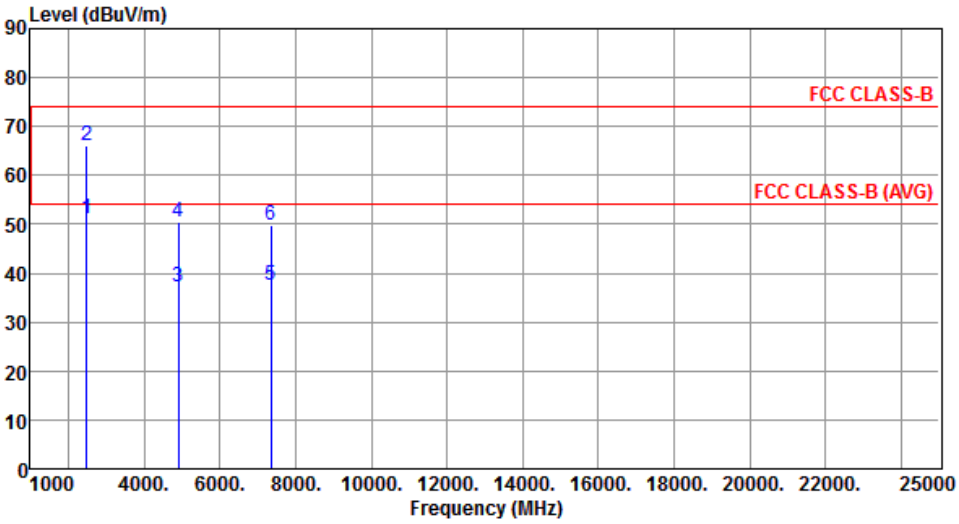
Modulation	HT40	Test Freq. (MHz)	2452
Polarization	Horizontal		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	52.54	54.00	-1.46	54.31	-1.77	Average	267	61
2	2483.50	67.39	74.00	-6.61	69.16	-1.77	Peak	267	61
3	4904.00	36.95	54.00	-17.05	32.32	4.63	Average	241	233
4	4904.00	50.19	74.00	-23.81	45.56	4.63	Peak	241	233
5	7356.00	37.15	54.00	-16.85	27.86	9.29	Average	246	55
6	7356.00	49.62	74.00	-24.38	40.33	9.29	Peak	246	55

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	HT40	Test Freq. (MHz)	2452
Polarization	Vertical		



	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB	Remark	ANT High cm	Turn Table deg
1	2483.50	51.22	54.00	-2.78	52.99	-1.77	Average	286	101
2	2483.50	66.08	74.00	-7.92	67.85	-1.77	Peak	286	101
3	4904.00	37.22	54.00	-16.78	32.59	4.63	Average	206	23
4	4904.00	50.45	74.00	-23.55	45.82	4.63	Peak	206	23
5	7356.00	37.42	54.00	-16.58	28.13	9.29	Average	263	74
6	7356.00	49.92	74.00	-24.08	40.63	9.29	Peak	263	74

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV/m) + Factor* (dB)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

3.6 Emissions in Non-Restricted Frequency Bands

3.6.1 Emissions in Non-Restricted Frequency Bands Limit

Peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz

3.6.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.6.3 Test Procedures

Reference level measurement

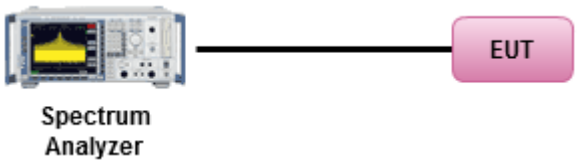
1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Use the peak marker function to determine the maximum PSD level

Emission level measurement

1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Scan Frequency range is up to 25GHz
4. Use the peak marker function to determine the maximum amplitude level

3.6.4 Test Setup

Transmitter Radiated Bandedge Emissions

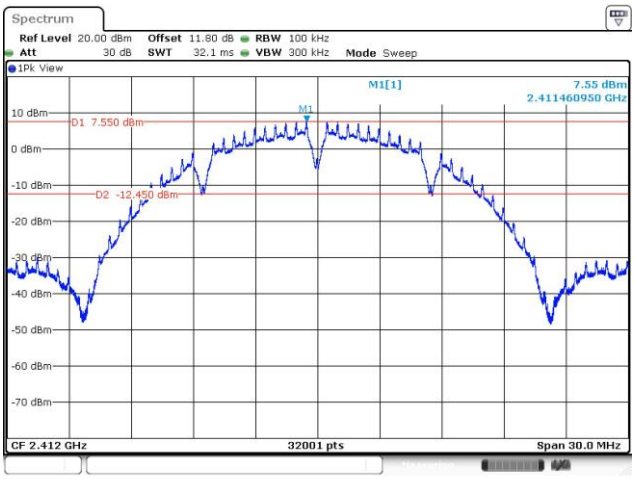
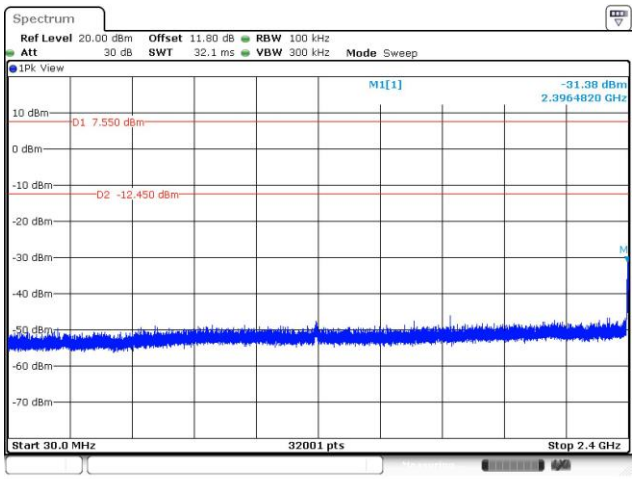
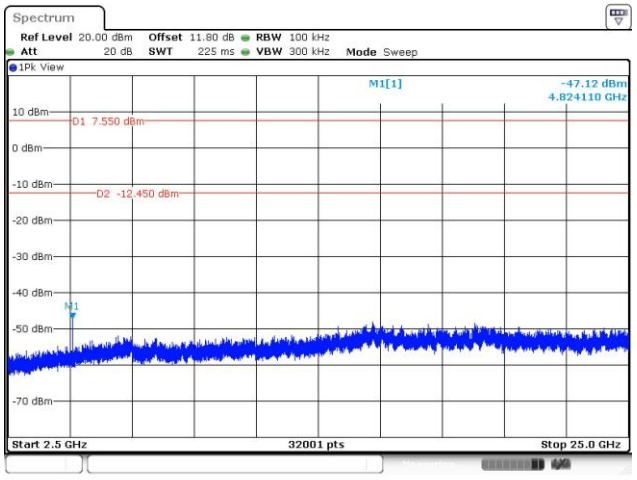
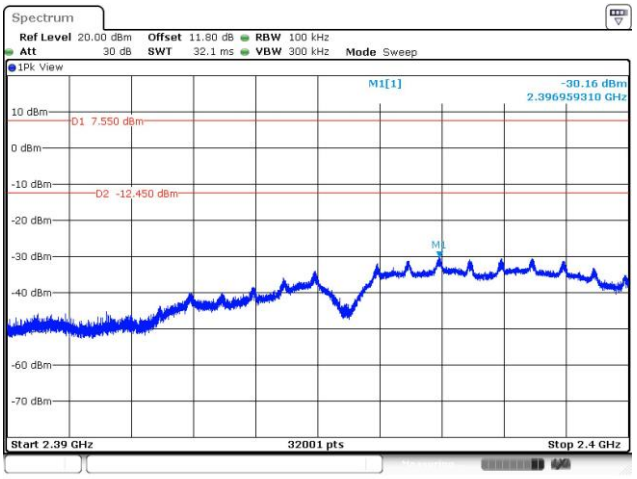


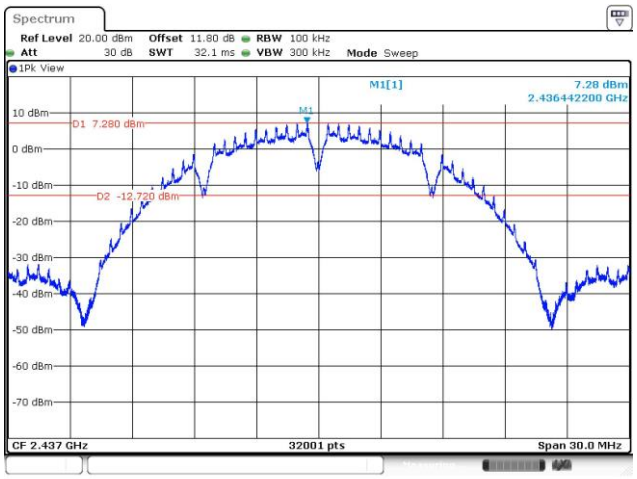
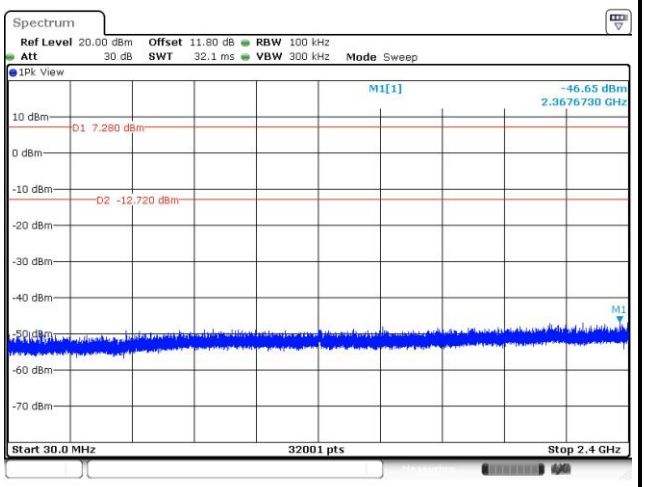
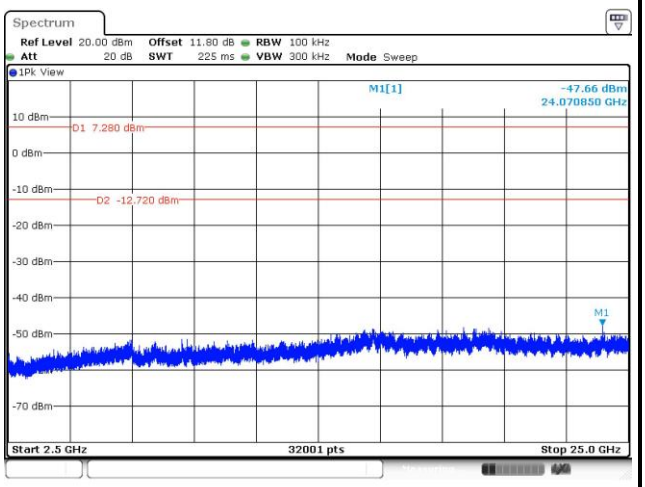
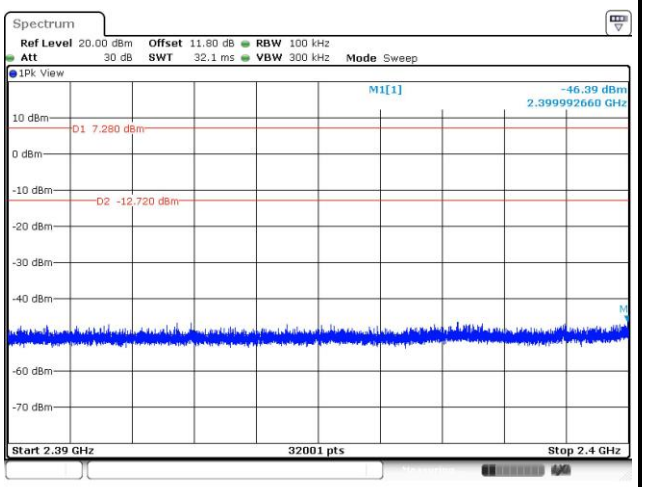
3.6.5 Test Result of Emissions in non-restricted frequency bands

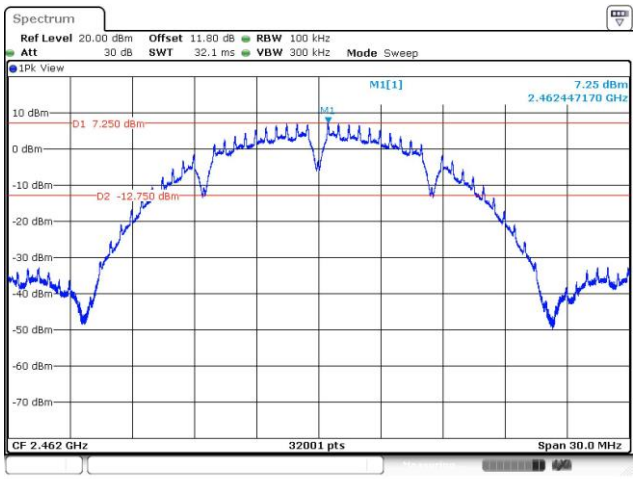
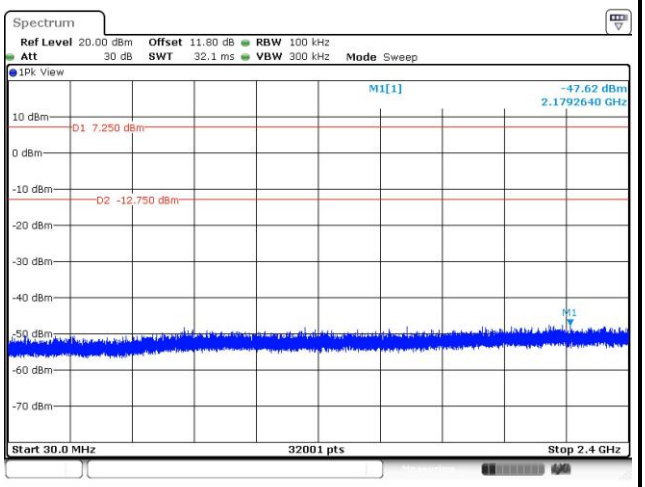
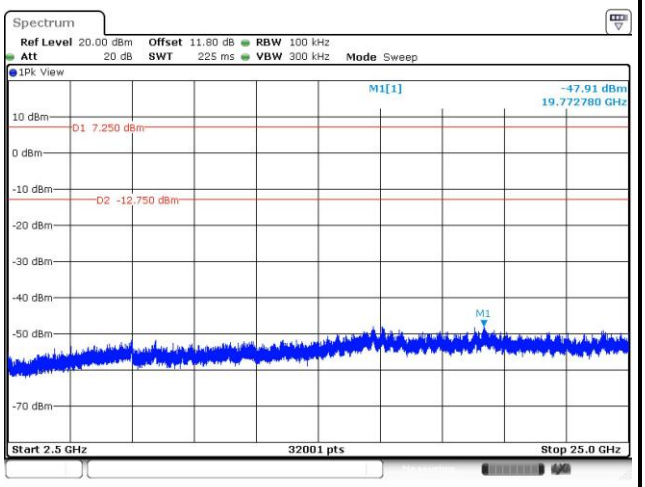
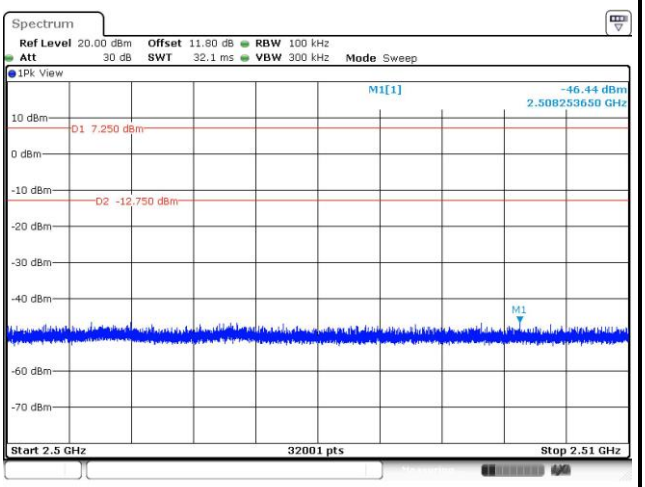
This test item is performed on each TX output individually without summing or adding 10 log(N_{ANT}) since measurements are made relative to the in-band emissions on the individual outputs. Only worst test result of each operating mode is presented.

3.6.6 Unwanted Emissions into Non-Restricted Frequency Bands

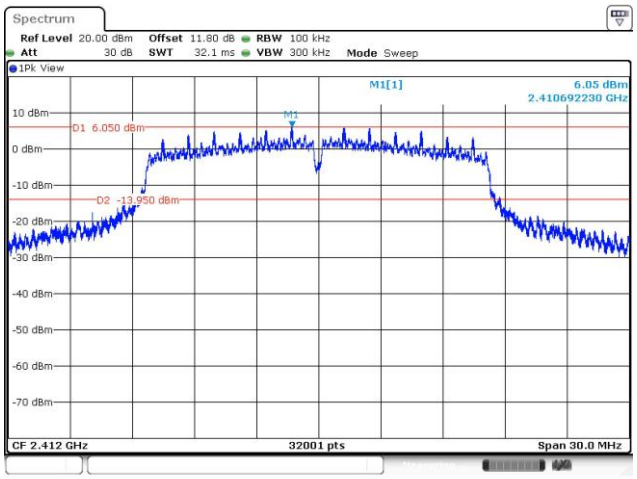
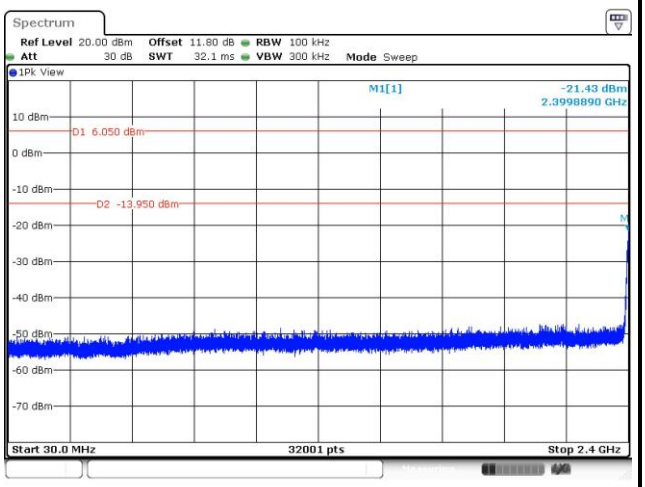
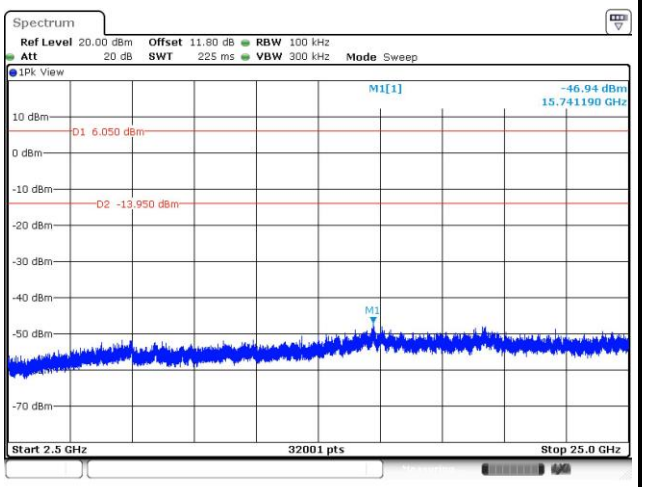
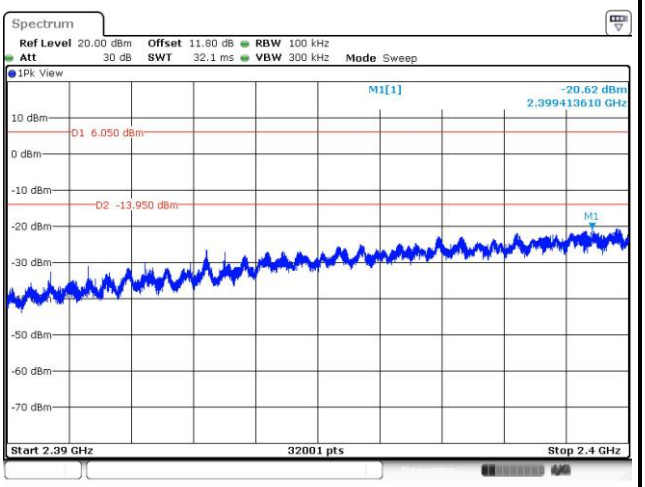
802.11b

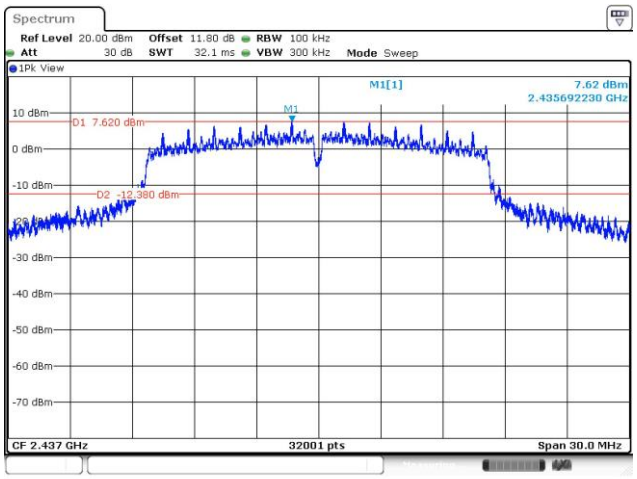
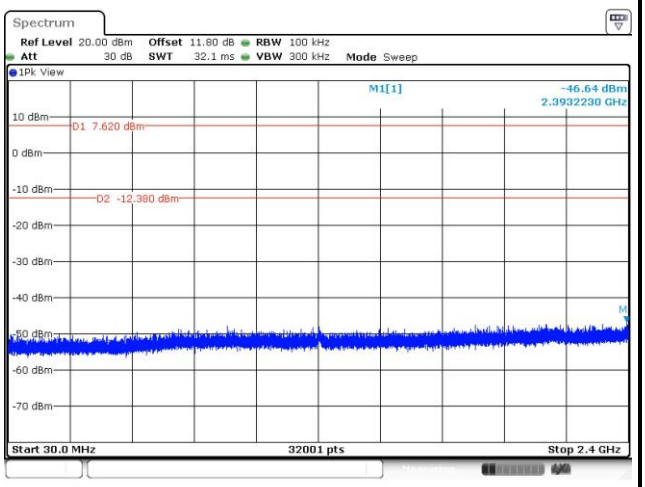
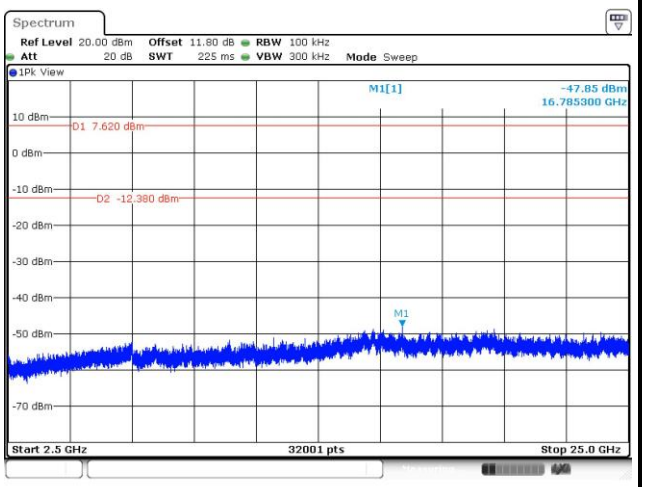
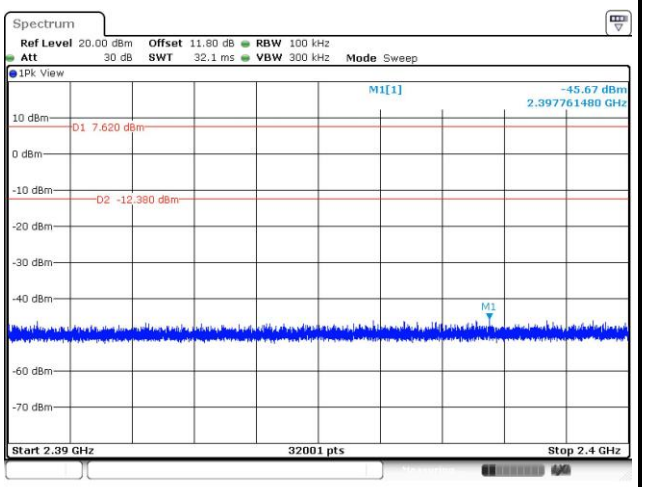
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

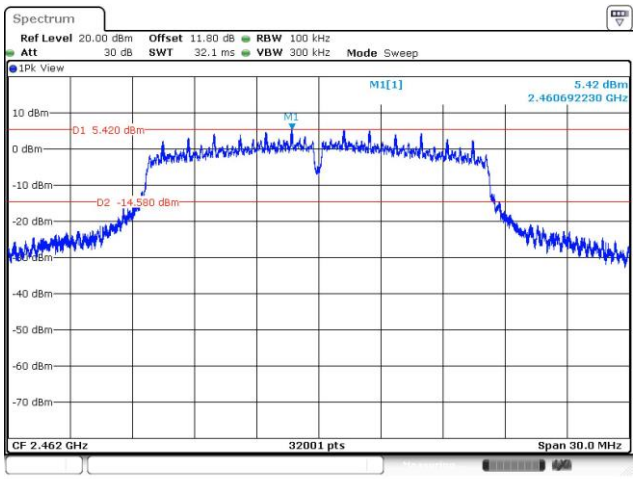
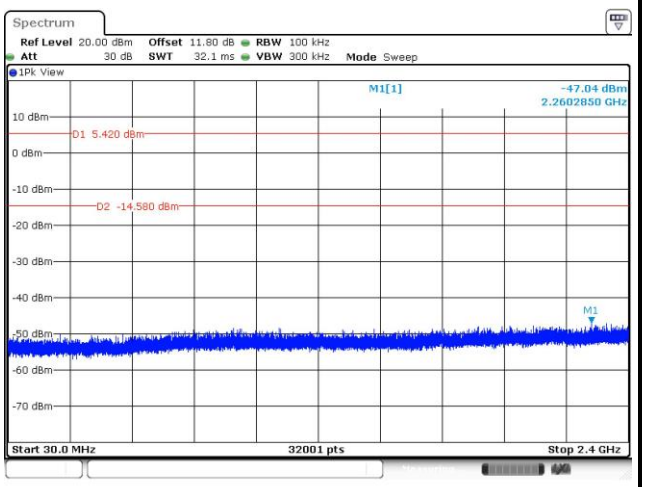
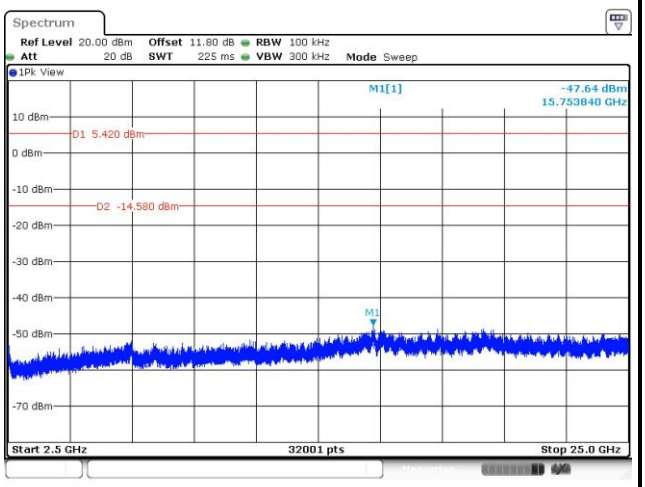
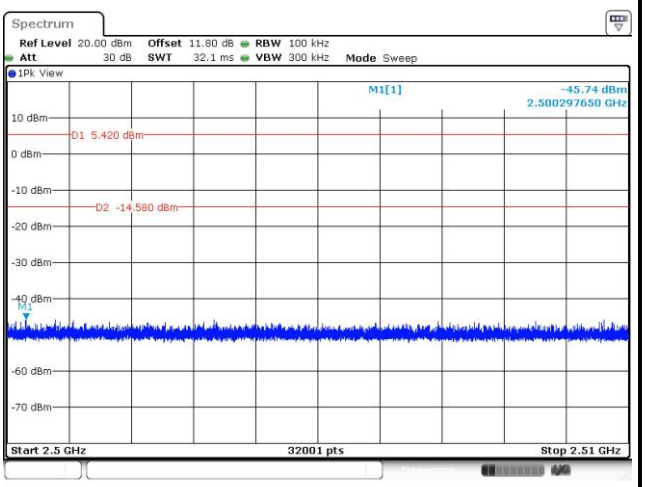
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

Reference Level	Tx 2462MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

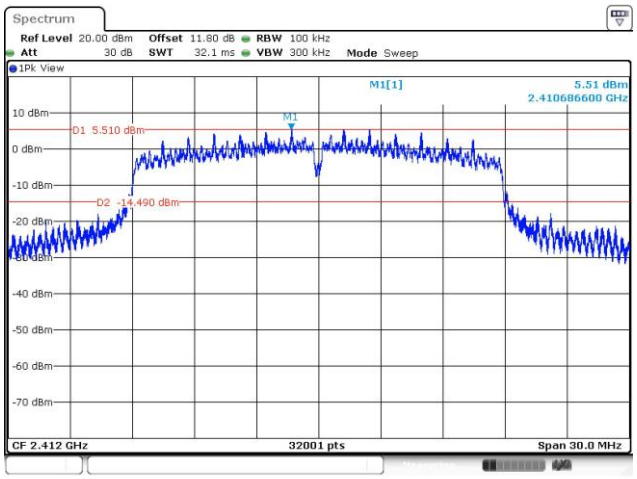
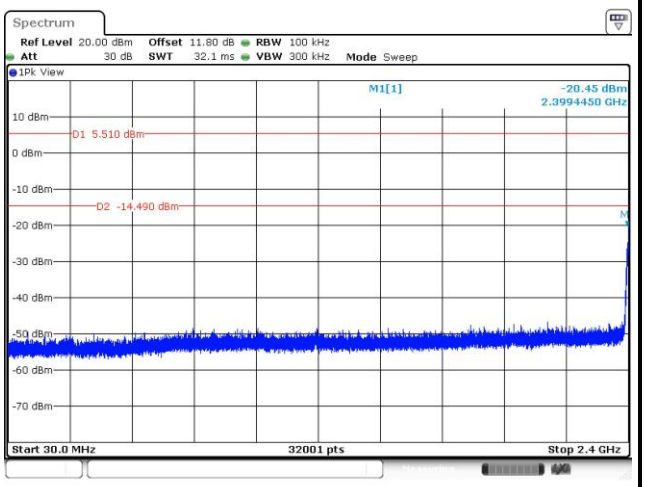
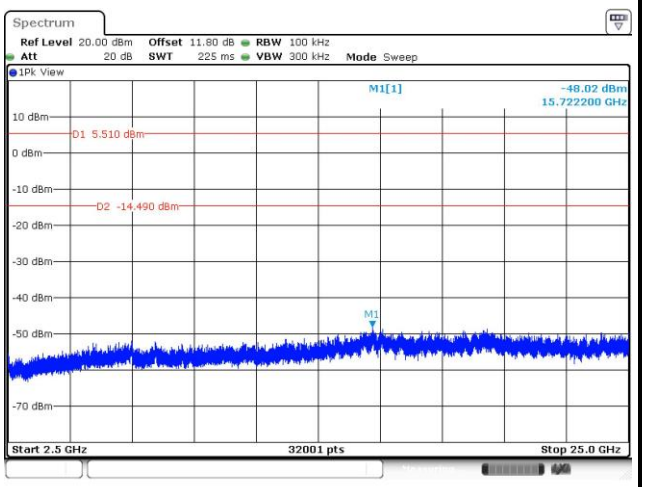
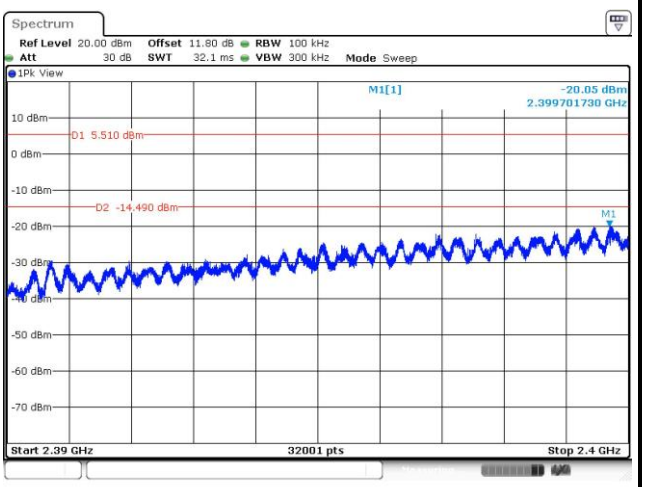
802.11g

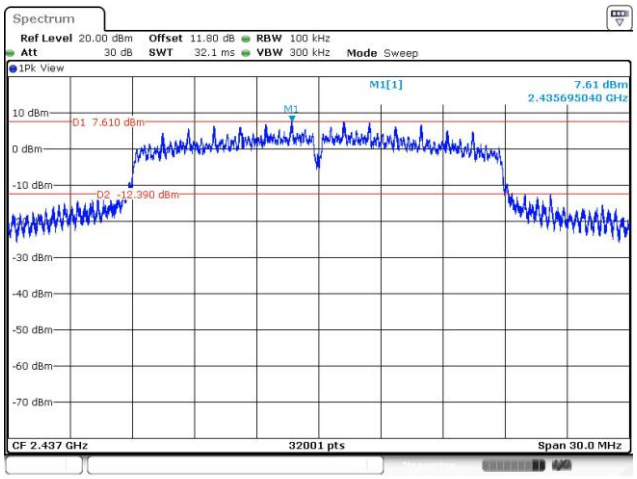
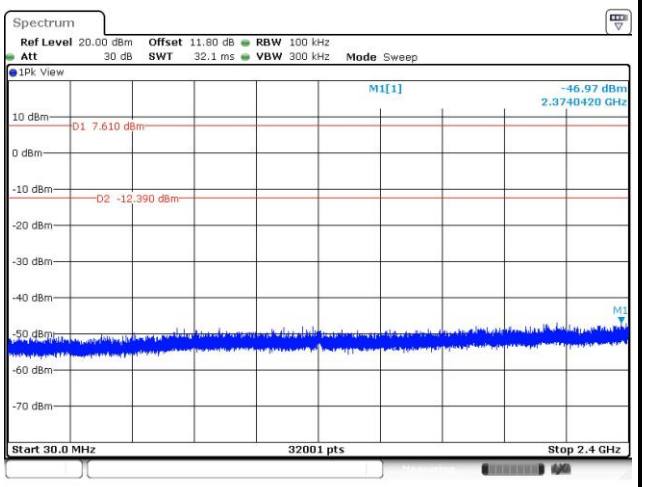
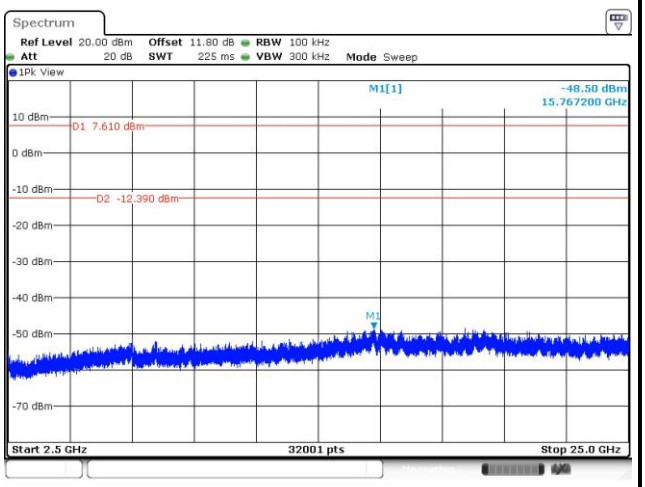
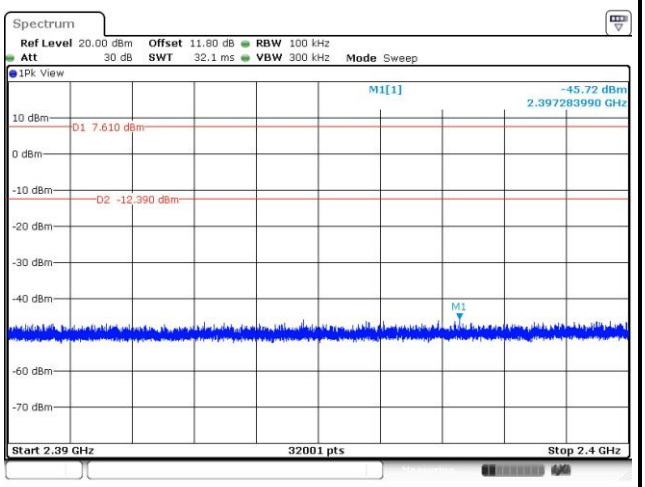
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

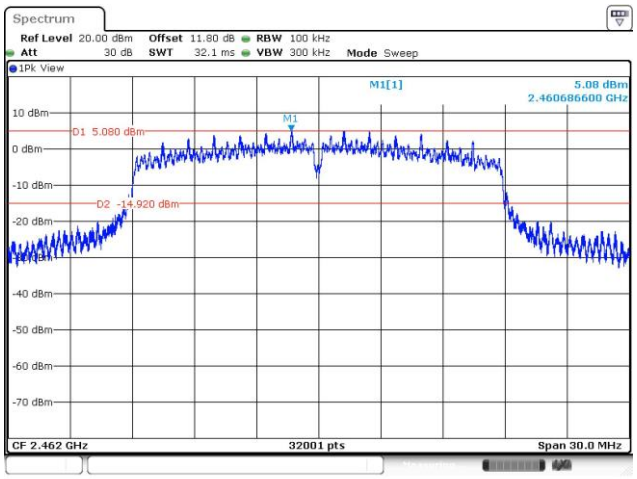
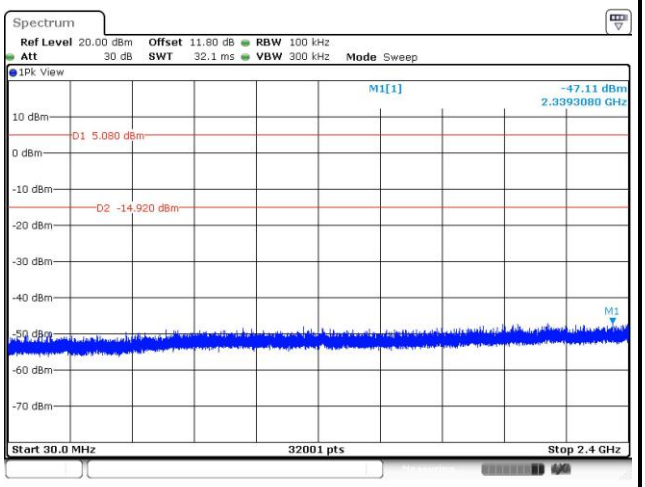
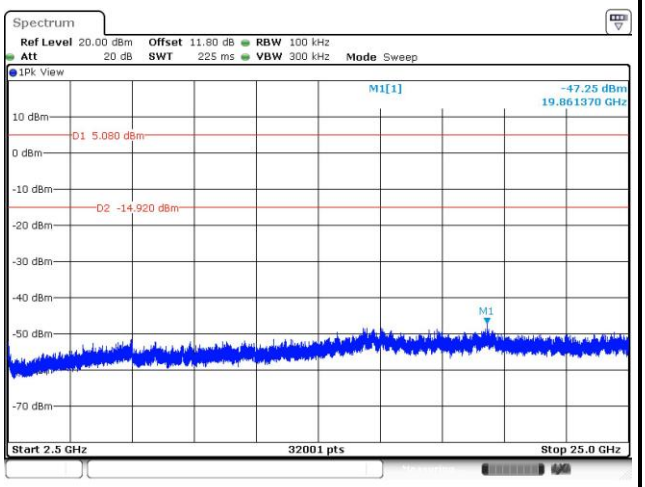
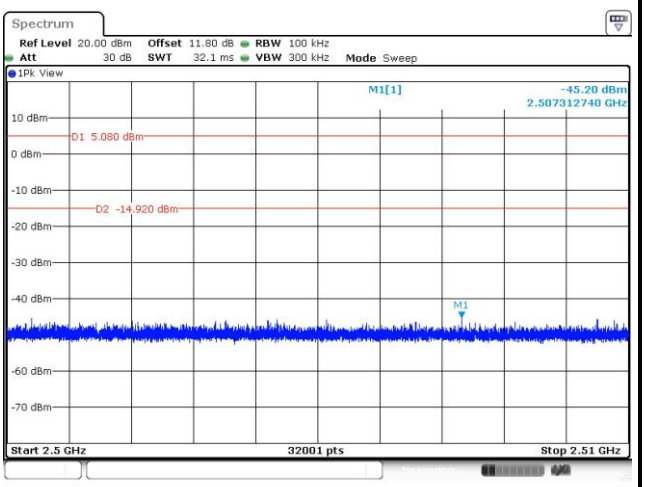
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

Reference Level	Tx 2462MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

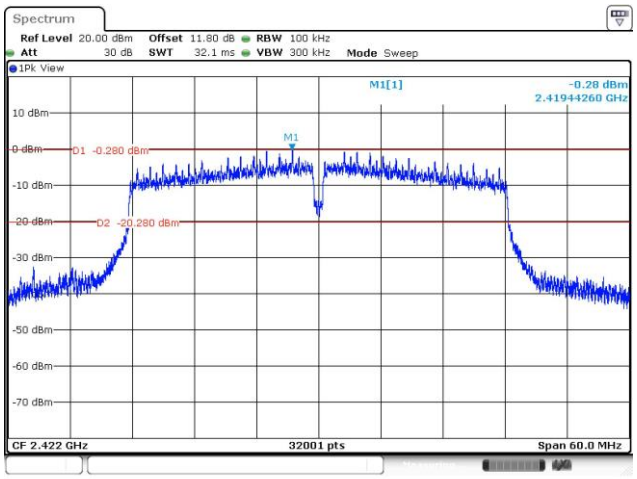
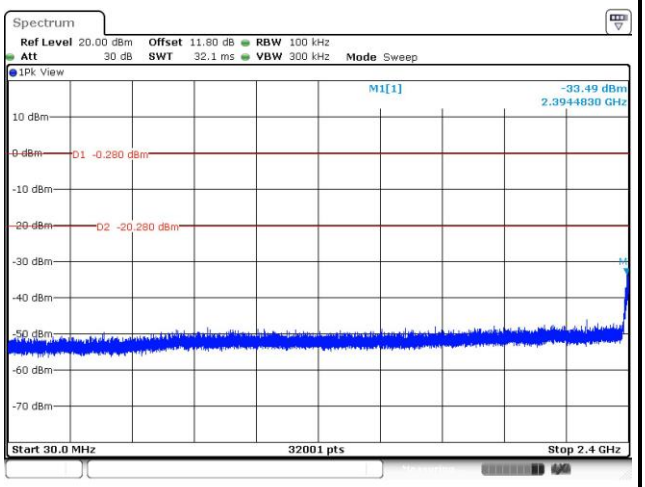
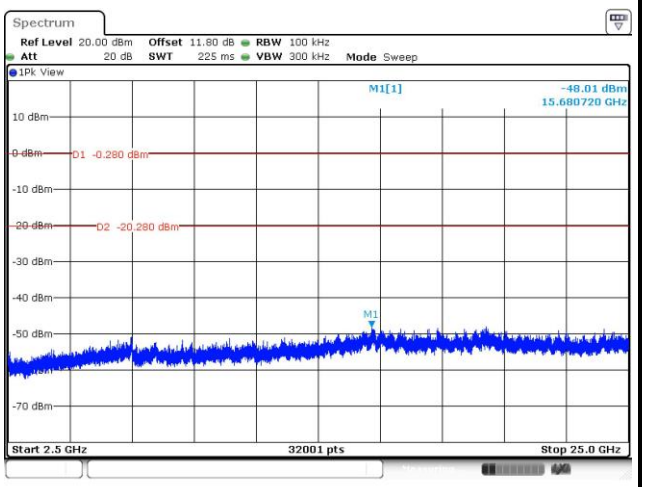
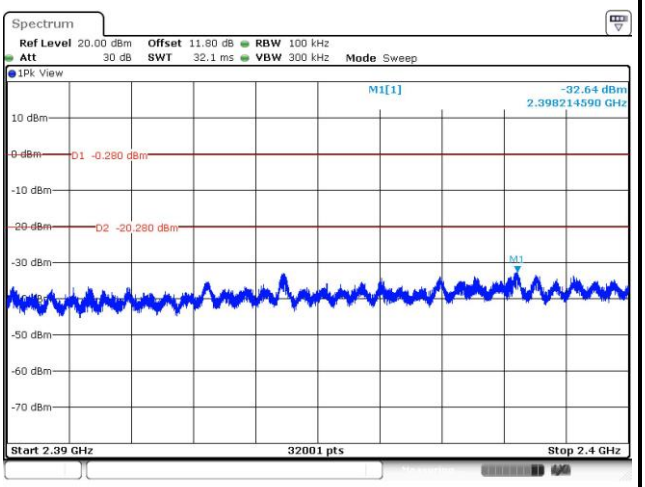
802.11n HT20

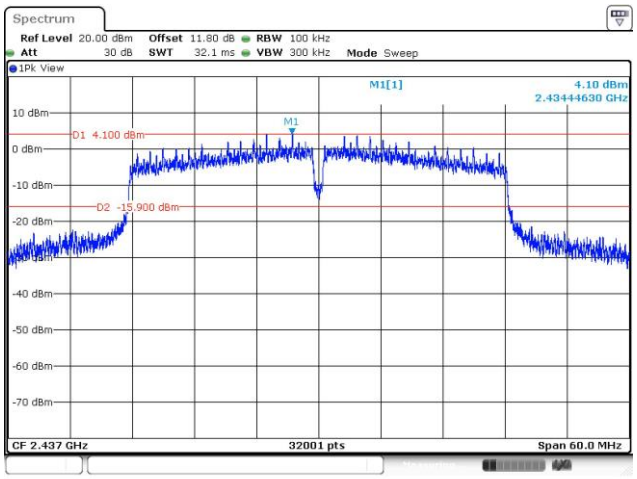
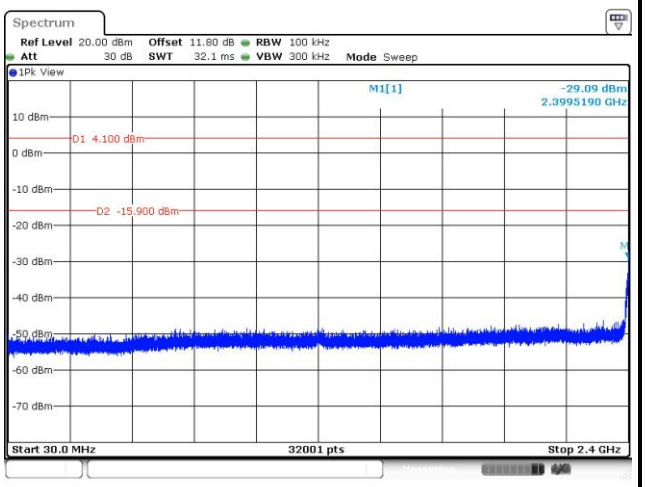
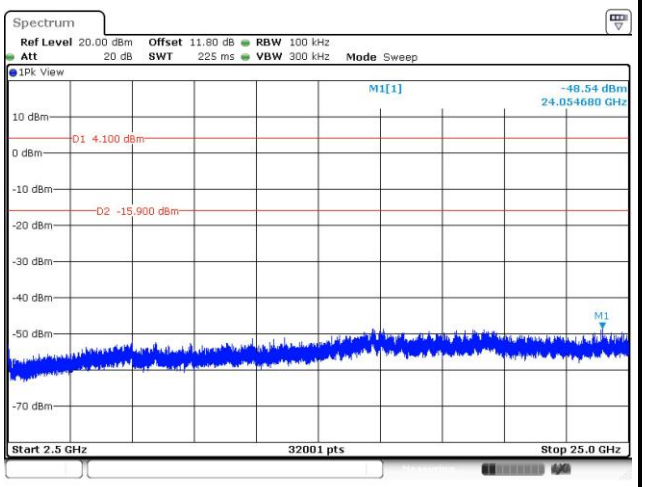
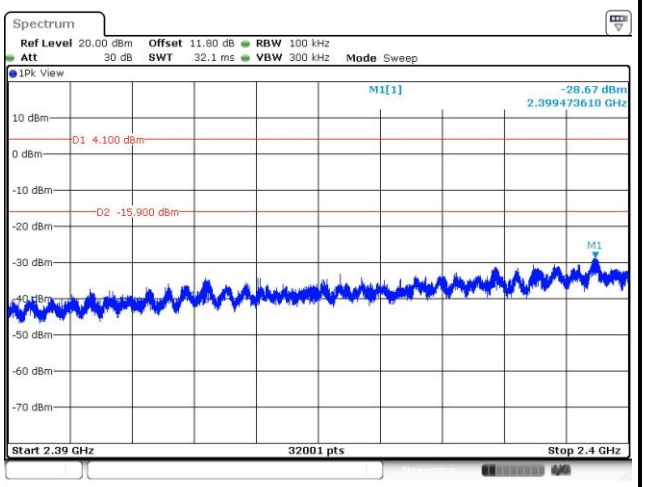
Reference Level	Tx 2412MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

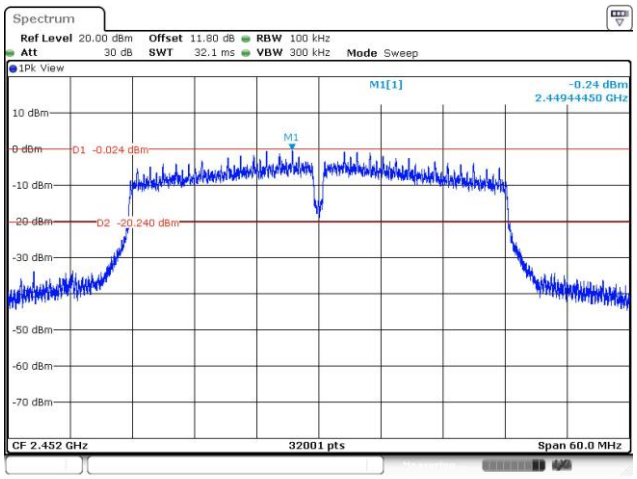
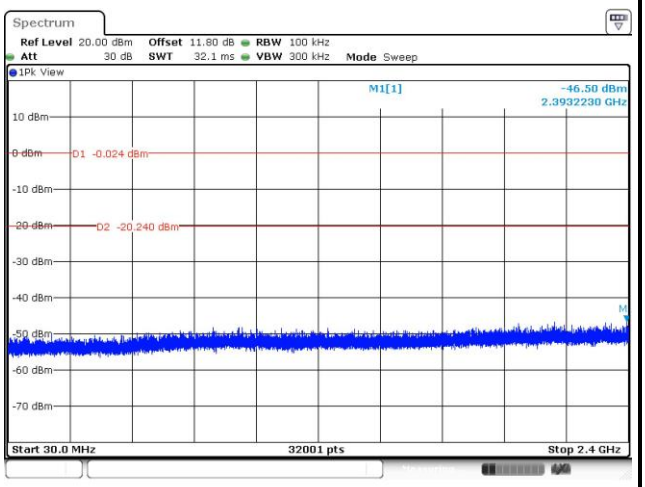
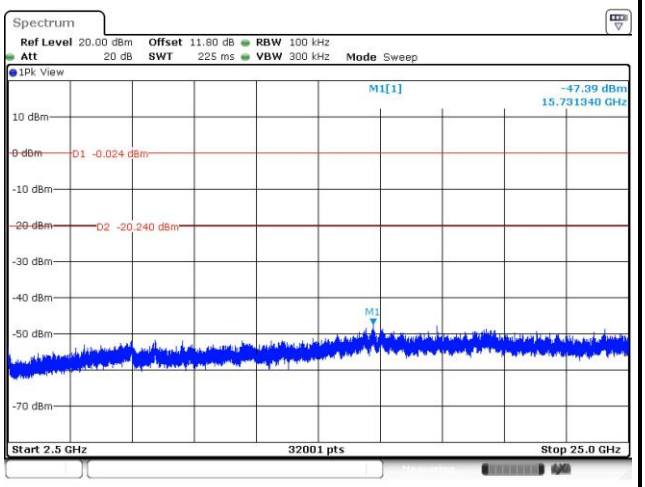
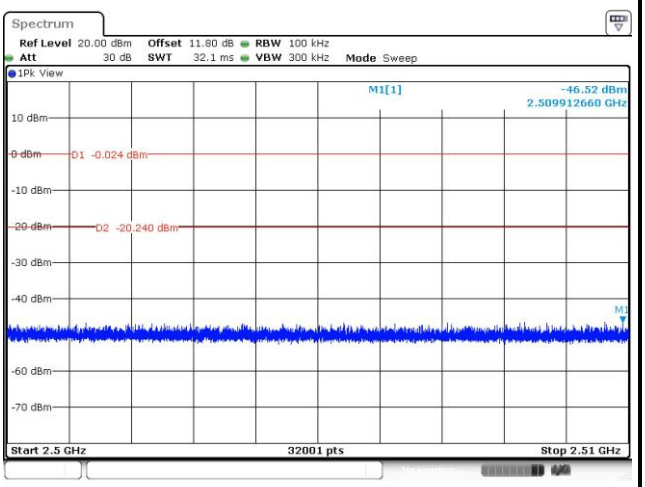
Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

Reference Level	Tx 2462MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

802.11n HT40

Reference Level	Tx 2422MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

Reference Level	Tx 2437MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

Reference Level	Tx 2452MHz / 30MHz~25GHz (down 20dBc)
	
---	
---	

4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website http://www.icertifi.com.tw.

Linkou	**Kwei Shan**	**Kwei Shan Site II**
Tel: 886-2-2601-1640	Tel: 886-3-271-8666	Tel: 886-3-271-8640
No. 30-2, Ding Fwu Tsuen, Lin Kou District, New Taipei City, Taiwan, R.O.C.	No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.	No. 14-1, Lane 19, Wen San 3rd St., Kwei Shan District, Tao Yuan City 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information.

Tel: 886-3-271-8666
Fax: 886-3-318-0155
Email: ICC_Service@icertifi.com.tw

==END==